

**REPORT No. 4
APRIL, 2000**

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This monthly report contains a comparison of Two-way Satellite Time Transfer (TW), Common-view Time Transfer (CV), and Carrier-Phase Time/Frequency Transfer (CP) data analyzed at USNO. Time transfer data is tabulated and analyzed in a one-point-per-day format for the list of timing labs given below. Because we currently process TW data only for those baselines which include USNO, not every baseline combination of these labs is included in this report.

*AMC Colorado Springs, Colorado U.S.A
NPL Teddington, Middlesex, UK
PTB Braunschweig, Germany
USNO Washington, D.C. USA*

HOW THE TABLES ARE CALCULATED

For each baseline, time-transfer data are collected from each of the TW, CV, and CP analysis groups at USNO. To each data time series, a one-day linear fit is made. From this fit, a value for time-transfer is selected which corresponds to an epoch at which a TW data point exists. For those days without TW data, the CP and CV time-transfer value is related to 12:00 UTC. Also, the RMS scatter about each linear fit is given in the table.

Following each table are graphs of TW-CV, TW-CP, and CV-CP differences. Error bars are drawn on each data point reflecting an RSS combination of the RMS values obtained from the linear fits to each TW, CV, and CP time series. Though the tables in each report will consist of one month of data, the graphs will be cumulative until one year of data is collected, after which the graphs will consist of a one-year moving window.

Basic hardware configurations at each site are provided at the end of the report. Because some sites may have more than one receiver/modem, a separate designation has been specified for each receiver combination. For example, the report includes 8 designations for USNO (e.g. USNO(a), USNO(b), ..., USNO(h)) where each designation corresponds to a different combination of CV, CP, and TW receivers/modems. Since each designation represents a combination of TW, CV, and CP receivers/modems, these hardware configuration tables will be somewhat redundant. For example, USNO(a) and USNO(b) differ only in the choice of CV receiver (i.e. the TW and CP hardware are the same for USNO(a) and USNO(b)).

NOTE: Currently, the following site combinations are such that CP receivers are NOT on the same reference standard as the CV and TW hardware: USNO(a), USNO(b), PTB, TUG. However, the USNO(a) and USNO(b) clock estimates are re-referenced to the same timing reference as the CV and TW hardware using an optic fiber

link. Also, CP clock estimates at PTB are referenced to the same timing reference as CV and TW data using data from a SRS620 time-interval counter.

ADJUSTMENTS TO THE DATA

Each table contains a column marked ADJUSTMENTS which indicate any manual adjustments made to the data. For example, we currently remove arbitrary values from the non-calibrated carrier-phase systems to account for receiver resets which can occur for example when a receiver's power is cycled. In particular, first differences of the carrier-phase estimates are taken and spikes larger than 10ns (accounting for large data gaps) are flagged as outliers. Flagged values are then replaced by linearly interpolating adjacent first differences. Finally, the series of first differences is then integrated back into the time domain by choosing an initial arbitrary constant so that all CP values are 0.000 on January 1, 2000. For these carrier-phase adjustments, the ADJUSTMENTS column represents the difference between the raw and the "cleaned" CP data, and is therefore a measure of the individual jumps removed. This is clearly not the optimal method of removing such jumps since some carrier-phase systems track a 1-pps input from the local reference which can be used to re-reference the receiver's internal clock to the external reference when such resets occur. However, since we do not have available such 1-pps for most of the non-USNO sites, we have opted instead to remain consistent and remove carrier-phase jumps according to this very simplistic method.

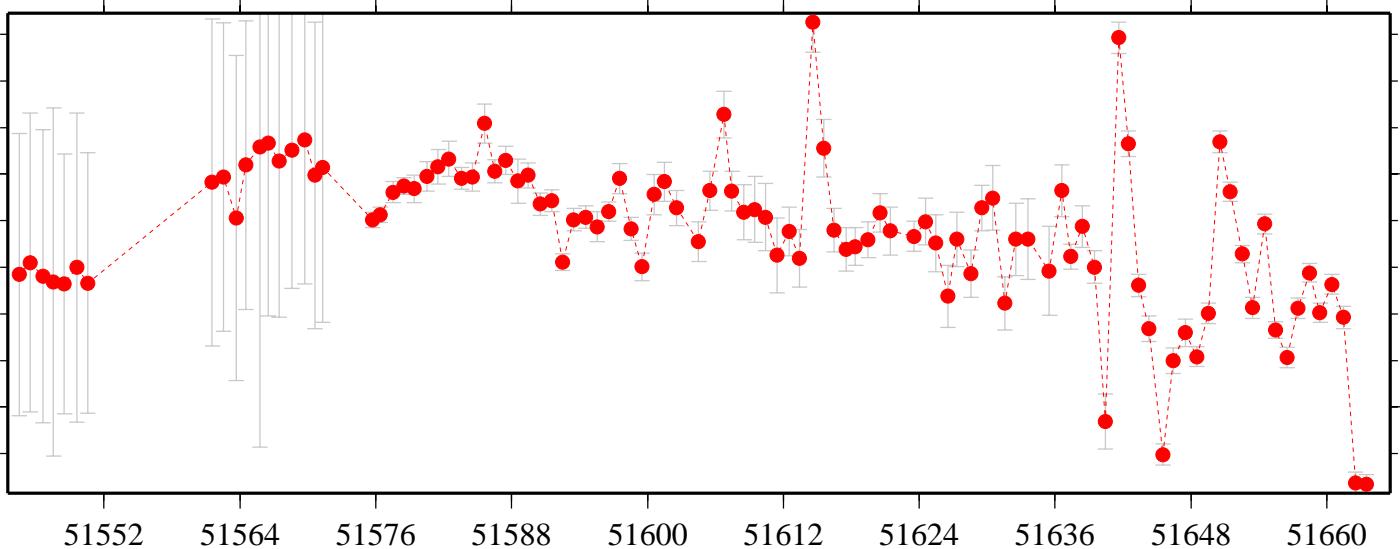
USNO(a) - AMC

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.4941	0.0	-56.9			56.9			0.1	1.4	
51636.5768	-0.2	-59.6			59.5			0.1	0.8	
51637.4094	0.2	-57.2	3.096		57.3	-2.9	-60.2	0.1	0.4	0.005
51638.3886	-0.2	-58.5			58.3			0.1	0.7	
51639.4719	0.0	-57.0			57.0			0.1	0.5	
51640.4518	0.1	-51.9			52.0			0.1	0.9	
51641.6200	0.5	-63.9			64.4			0.1	0.5	
51642.4934	0.3	-60.7			61.0			0.1	0.4	
51643.3689	0.4	-56.1	3.106	+ 1809.239CP	56.4	-2.8	-59.2	0.1	0.3	0.002
51644.3059	0.4	-54.6	3.316		55.0	-2.9	-57.9	0.1	0.4	0.004
51645.5347	0.7	-50.2	3.279		51.0	-2.5	-53.5	0.1	0.3	0.003
51646.4094	0.4	-53.6	3.130		54.0	-2.7	-56.7	0.1	0.4	0.003
51647.4941	0.4	-54.5	2.769		54.9	-2.4	-57.3	0.1	0.4	0.009
51648.5351	0.6	-53.6			54.1			0.1	0.3	
51649.5351	0.4	-55.1	2.619		55.5	-2.2	-57.7	0.1	0.3	0.002
51650.5768	0.5	-60.5			61.0			0.1	0.3	
51651.4511	0.3	-59.2	2.342	- 1368.893CP	59.4	-2.1	-61.5	0.1	0.3	0.004
51652.5344	-0.1	-57.5	2.844		57.4	-2.9	-60.3	0.1	0.3	0.004
51653.4511	0.4	-55.3	3.078		55.7	-2.7	-58.4	0.1	0.3	0.004
51654.5139	0.3	-58.1	3.244		58.4	-3.0	-61.4	0.1	0.3	0.003
51655.4934	0.3	-54.7	3.530		55.0	-3.2	-58.2	0.1	0.3	0.005
51656.4934	0.3	-53.8	5.767		54.1	-5.4	-59.5	0.1	0.3	Inf
51657.4504	0.5	-55.2	3.596		55.7	-3.1	-58.8	0.1	0.3	0.005
51658.4941	0.8	-56.0	3.349		56.8	-2.5	-59.3	0.1	0.3	0.003
51659.4094	1.2	-54.4	3.129		55.5	-2.0	-57.5	0.1	0.3	0.003
51660.4518	0.8	-55.7	3.202		56.5	-2.4	-58.9	0.1	0.3	0.003
51661.4719	0.4	-55.0	3.232		55.4	-2.9	-58.2	0.1	0.3	0.004
51662.5351	-0.1	-50.1	3.006		50.1	-3.1	-53.1	0.1	0.3	0.003
51663.4934	0.2	-49.8			50.0			0.1	0.3	

The ADJUSTMENTS column indicates any manual adjustments (e.g. calibration) that have been applied to either TW, CV, or CP data. In particular, since CP data is currently obtained from non-calibrated systems, arbitrary offsets are often applied to CP data to keep column widths small.

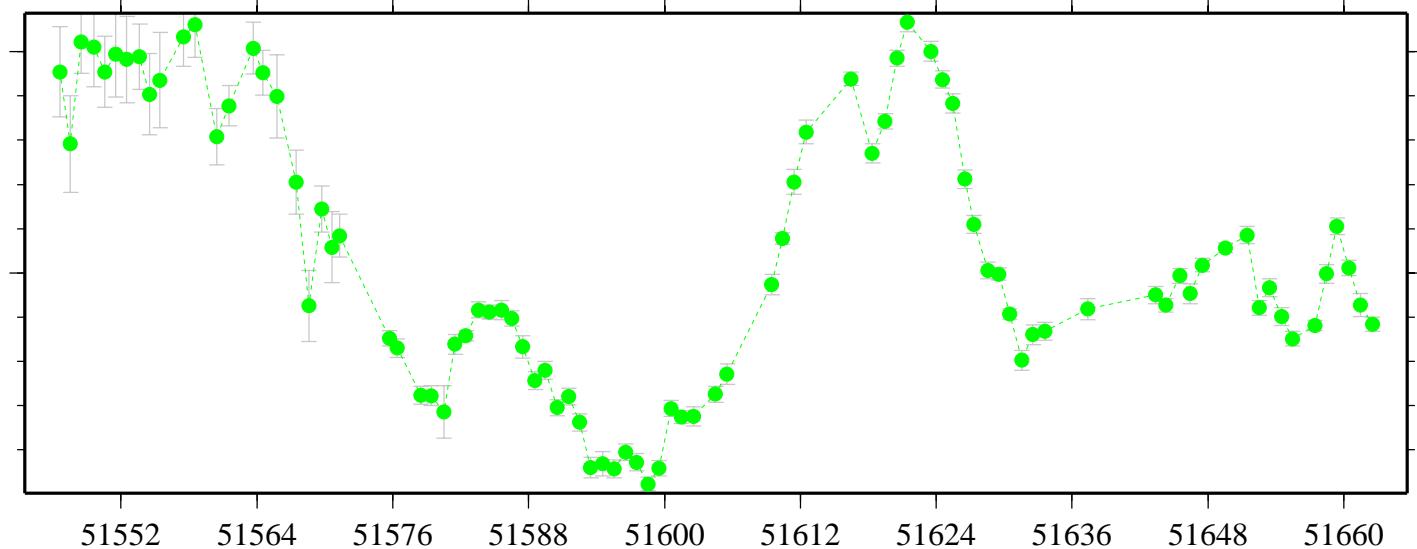
USNO(a)-AMC (TW-CV)

NANOSECONDS



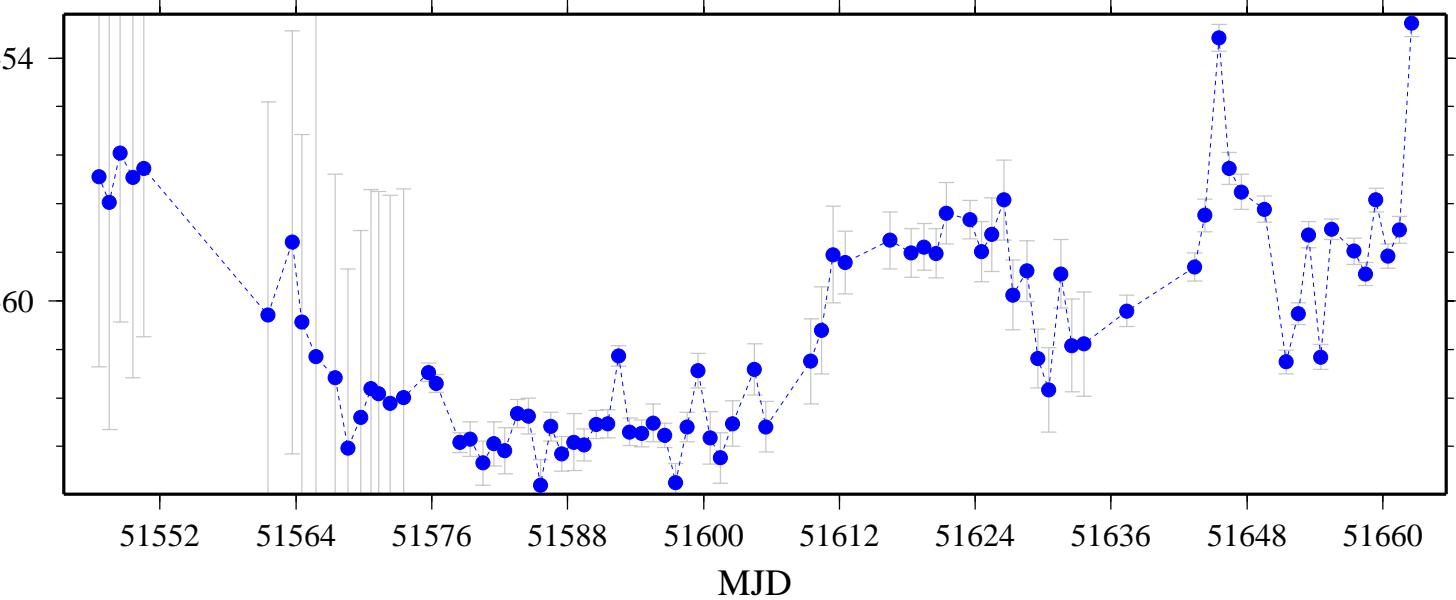
USNO(a)-AMC (TW-CP)

NANOSECONDS



USNO(a)-AMC (CV-CP)

NANOSECONDS



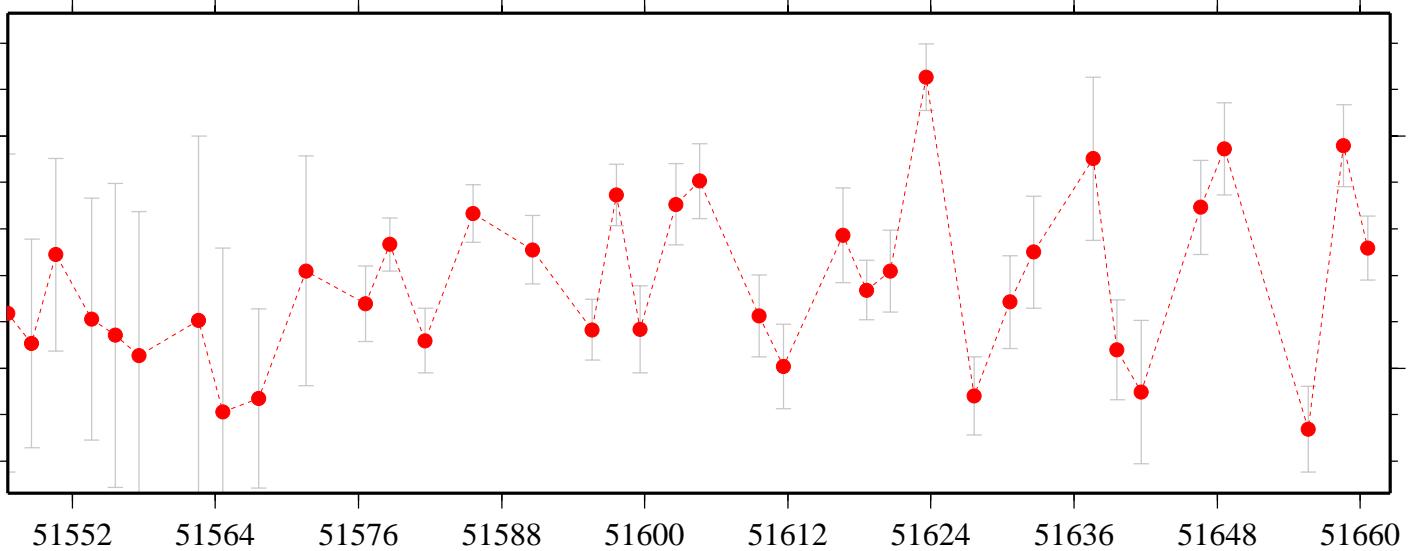
USNO(b) - NPL

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		34.5							1.3	
51636.5000		17.7							2.1	
51637.6097	16.6	17.6	-79.827		-1.0	96.4	97.4	0.9	3.4	0.005
51638.5000		18.0							2.0	
51639.6097	15.1	24.3			-9.2			1.2	1.8	
51640.5000		21.6							3.5	
51641.6097	11.0	22.0			-11.0			1.4	2.7	
51642.5000		11.1							1.9	
51643.5000		13.2	-83.575	+ 2594.895 _{CP}			96.8		1.5	0.008
51644.5000		14.8	-84.899				99.7		1.8	0.007
51645.5000		22.7	-85.967				108.7		1.2	0.004
51646.6100	7.5	10.6	-86.762		-3.1	94.3	97.4	1.0	1.8	0.004
51647.5000		11.7	-87.598				99.3		1.4	0.004
51648.6097	6.5	7.1	-88.315		-0.6	94.8	95.4	1.3	1.5	0.005
51649.5000		12.3	-88.528				100.9		0.8	0.004
51650.5000		6.5							1.2	
51651.5000		3.2	-89.533	- 1955.890 _{CP}			92.8		1.5	0.006
51652.5000		9.9	-89.521				99.4		1.6	0.006
51653.5000		18.7	-89.816				108.5		2.6	0.012
51654.5000		12.4	-89.784				102.2		2.2	0.012
51655.6098	1.8	14.4	-89.681		-12.6	91.5	104.1	0.8	1.7	0.008
51656.5000		15.0	-90.115				105.1		1.8	0.006
51657.5000		13.5	-90.239	- 71599.955 _{CP}			103.8		1.1	0.008
51658.6097	1.2	1.6	-90.824		-0.4	92.0	92.4	0.7	1.6	0.006
51659.5000		11.3	-91.177				102.5		1.1	0.004
51660.6097	1.4	6.2	-91.294	+ 71600.651 _{CP}	-4.8	92.7	97.5	0.9	1.0	0.006
51661.5000		1.3	-91.546				92.8		0.7	0.003
51662.5000		0.5	-91.991				92.4		0.9	0.017
51663.5000		12.6							1.5	

The **ADJUSTMENTS** column indicates any manual adjustments (e.g. calibration) that have been applied to either TW, CV, or CP data. In particular, since CP data is currently obtained from non-calibrated systems, arbitrary offsets are often applied to CP data to keep column widths small.

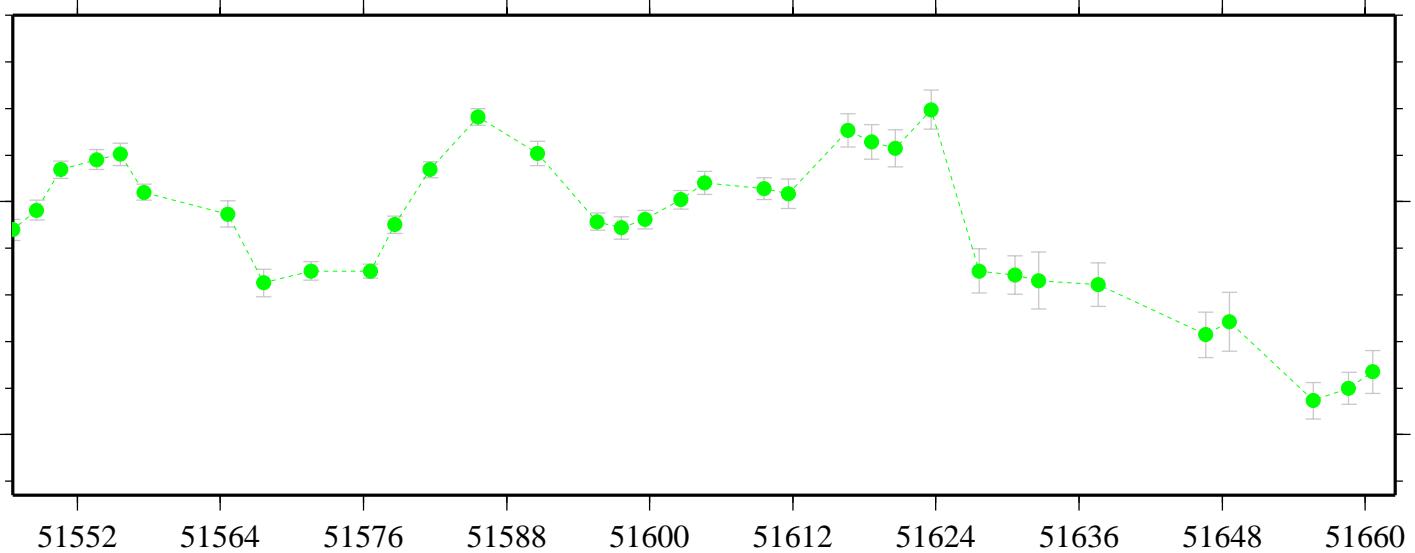
USNO(b)-NPL (TW-CV)

NANOSECONDS



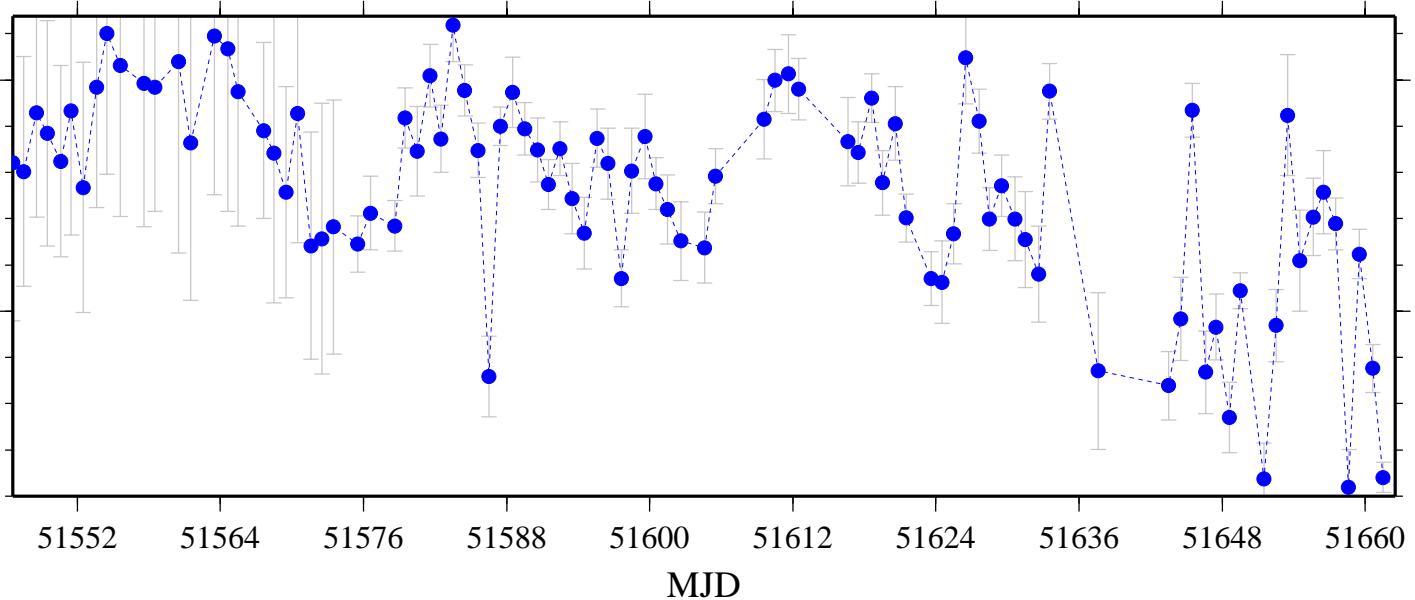
USNO(b)-NPL (TW-CP)

NANOSECONDS



USNO(b)-NPL (CV-CP)

NANOSECONDS



x and y-axes are same scale

USNO(b) - PTB

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		21.3							1.7	
51636.5000		5.7							1.7	
51637.6160	4.7	3.4	45.697		1.3	-41.0	-42.3	0.5	1.2	0.015
51638.5000		10.8							1.5	
51639.6160	6.5	22.3			-15.8			0.4	2.2	
51640.5000		19.4							3.7	
51641.6160	7.2	17.5			-10.3			0.5	3.0	
51642.5000		3.8							1.0	
51643.5000		9.5							1.1	
51644.6160	5.6	10.0			-4.4			0.4	1.2	
51645.5000		18.1	45.994	+ 2595.174CP			-27.9		1.1	0.025
51646.6160	4.0	5.3			-1.4			0.4	1.1	
51647.5000		9.6							0.9	
51648.6160	6.7	8.6	44.966		-1.9	-38.3	-36.4	0.5	1.5	0.034
51649.5000		14.5	45.759				-31.3		0.8	0.020
51650.5000		8.3							0.8	
51651.6160	2.6	-1.6	45.517	- 1954.851CP	4.3	-42.9	-47.1	0.6	0.9	0.011
51652.5000		11.0	46.107				-35.1		1.1	0.018
51653.6160	4.6	21.4	47.102		-16.8	-42.5	-25.7	0.5	2.6	0.026
51654.5000		10.8							1.2	
51655.5000		19.3							1.4	
51656.5000		16.8							1.6	
51657.5000		17.3							1.2	
51658.6160	4.1	3.6	46.824	- 1.400CP	0.6	-42.7	-43.3	0.6	1.5	0.020
51659.5000		14.4	45.616				-31.2		0.9	0.013
51660.5000		9.5	45.380				-35.9		0.8	0.013
51661.5000		5.6	44.210				-38.6		0.8	0.017
51662.6160	-0.9	5.9			-6.8			0.5	0.8	
51663.5000		14.4							1.2	

The **ADJUSTMENTS** column indicates any manual adjustments (e.g. calibration) that have been applied to either TW, CV, or CP data. In particular, since CP data is currently obtained from non-calibrated systems, arbitrary offsets are often applied to CP data to keep column widths small.

USNO(b)-PTB (TW-CV)

NANOSECONDS

0.0

-11.5

51552 51564 51576 51588 51600 51612 51624 51636 51648 51660

USNO(b)-PTB (TW-CP)

NANOSECONDS

-24

-36

51552 51564 51576 51588 51600 51612 51624 51636 51648 51660

USNO(b)-PTB (CV-CP)

NANOSECONDS

-18.5

-37.0

51552 51564 51576 51588 51600 51612 51624 51636 51648 51660

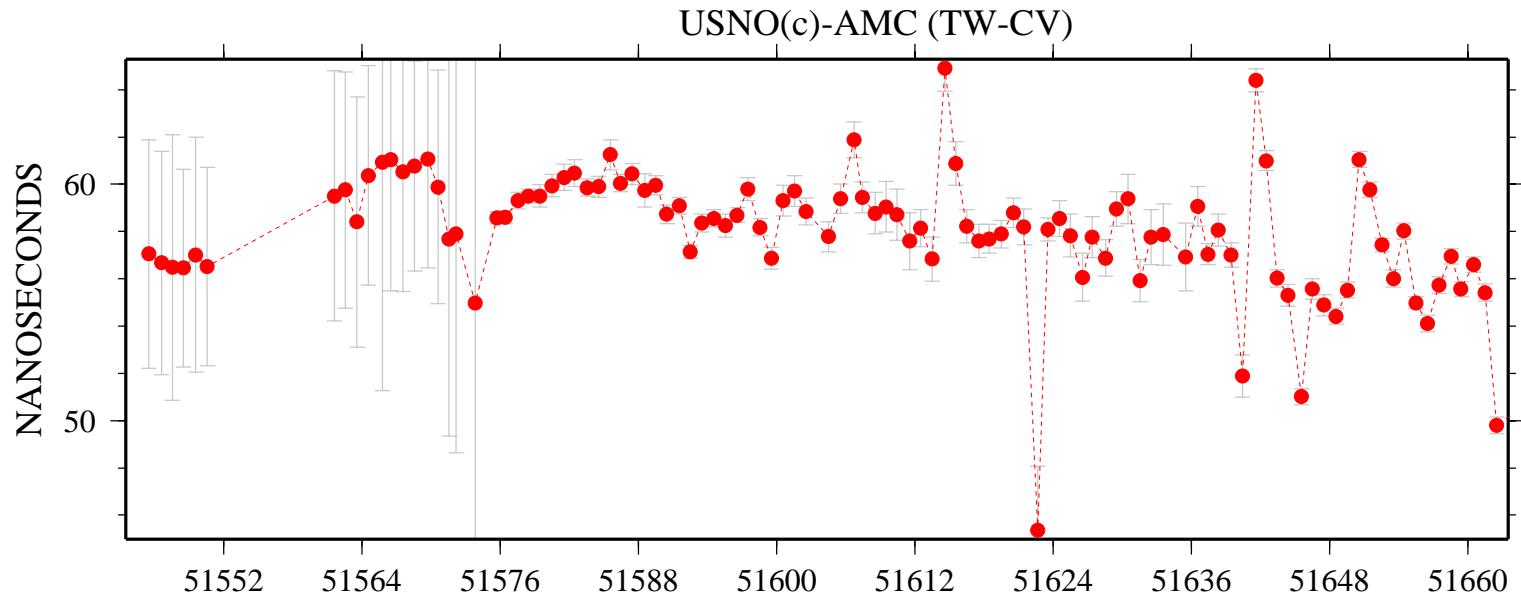
MJD

USNO(c) - AMC

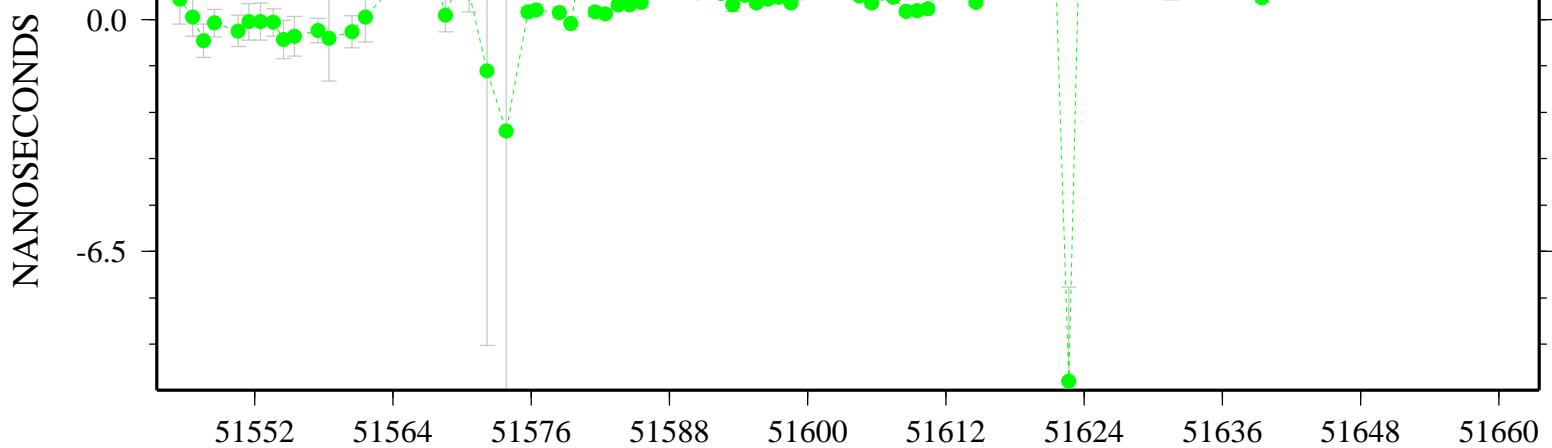
	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.4726	0.0	-56.9	-1.349		56.9	1.4	-55.5	0.1	1.4	0.003
51636.5351	-0.3	-59.4	-1.235		59.1	0.9	-58.1	0.1	0.8	0.008
51637.4525	-0.1	-57.1	-1.278		57.0	1.2	-55.8	0.2	0.4	0.003
51638.3469	-0.3	-58.4	-1.382		58.1	1.1	-57.0	0.2	0.7	0.005
51639.4719	0.0	-57.0	-0.565		57.0	0.6	-56.4	0.1	0.5	0.061
51640.4518	0.0	-51.9	-0.945	- 782.411 CP	51.9	0.9	-51.0	0.1	0.9	0.005
51641.6200	0.5	-63.9	-1.528		64.4	2.0	-62.4	0.1	0.5	0.012
51642.4934	0.3	-60.7			61.0			0.1	0.4	
51643.4522	0.2	-55.9			56.0			0.1	0.3	
51644.3691	0.3	-55.0	-0.745		55.3	1.1	-54.2	0.2	0.4	0.002
51645.5347	0.8	-50.2	-0.686		51.0	1.5	-49.5	0.1	0.3	0.003
51646.4931	0.5	-55.1	-0.955		55.6	1.4	-54.2	0.1	0.4	0.003
51647.5143	0.3	-54.6	-1.043		54.9	1.4	-53.5	0.1	0.4	0.002
51648.5768	0.5	-53.9			54.4			0.1	0.3	
51649.5351	0.4	-55.1	-1.681		55.5	2.1	-53.4	0.1	0.3	0.003
51650.5768	0.6	-60.5	-1.454		61.1	2.0	-59.0	0.1	0.3	0.002
51651.4934	0.2	-59.5	-1.568	+ 586.131 CP	59.8	1.8	-58.0	0.2	0.3	0.003
51652.5344	0.0	-57.5	-1.549		57.4	1.5	-55.9	0.1	0.3	0.004
51653.5344	0.3	-55.8	-1.571		56.0	1.8	-54.2	0.2	0.3	0.004
51654.4511	0.1	-57.9	-1.592		58.0	1.7	-56.3	0.2	0.3	0.003
51655.4934	0.3	-54.7	-1.625		55.0	1.9	-53.1	0.1	0.3	0.004
51656.5150	0.1	-54.0			54.1			0.1	0.3	
51657.4927	0.4	-55.3	-1.352		55.7	1.8	-54.0	0.1	0.3	0.002
51658.5351	0.7	-56.2	-2.098		56.9	2.8	-54.1	0.2	0.3	0.003
51659.4094	1.2	-54.4			55.6			0.1	0.3	
51660.4726	0.8	-55.8	-1.472		56.6	2.3	-54.3	0.1	0.3	0.002
51661.4740	0.4	-55.0	-1.784		55.4	2.2	-53.2	0.2	0.3	0.002
51662.4927	-0.2	-50.0	-2.135		49.8	2.0	-47.8	0.1	0.3	0.003
51663.5139	0.1	-50.1			50.2			0.1	0.3	

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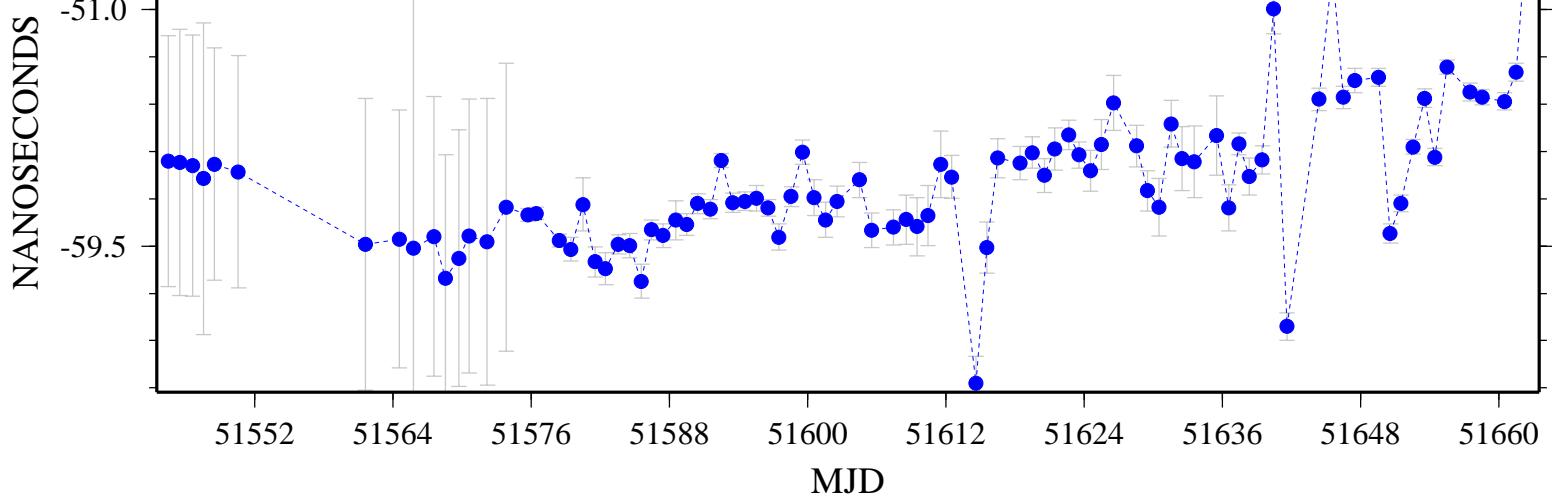
USNO(c)-AMC (TW-CV)



USNO(c)-AMC (TW-CP)



USNO(c)-AMC (CV-CP)



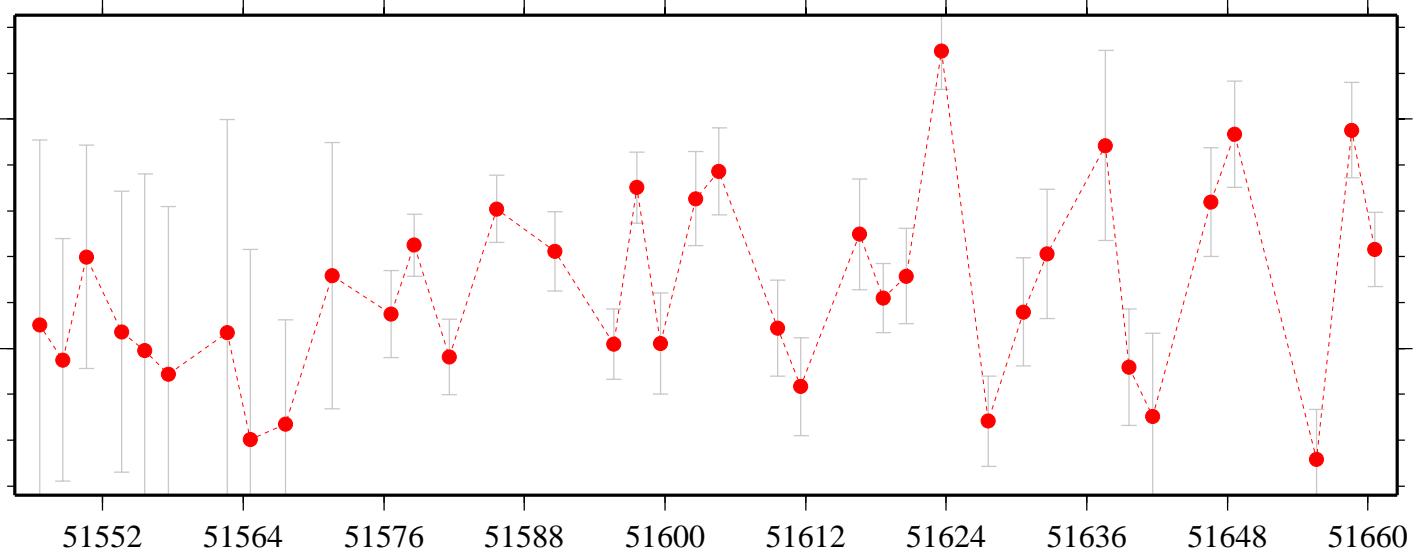
USNO(d) - NPL

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		34.5	-78.341				112.8		1.3	0.009
51636.5000		17.7	-79.144				96.8		2.1	0.012
51637.6097	16.6	17.6	-80.588		-1.0	97.2	98.2	0.9	3.4	0.006
51638.5000		18.0							2.0	
51639.6097	15.1	24.3	-82.866		-9.2	97.9	107.1	1.2	1.8	0.186
51640.5000		21.6	-84.115				105.7		3.5	0.006
51641.6097	11.0	22.0	-85.367		-11.0	96.4	107.4	1.4	2.7	0.009
51642.5000		11.1							1.9	
51643.5000		13.2							1.5	
51644.5000		14.8	-89.286				104.1		1.8	0.005
51645.5000		22.7	-90.164				112.9		1.2	0.004
51646.6100	7.5	10.6	-90.897		-3.1	98.4	101.5	1.0	1.8	0.004
51647.5000		11.7	-91.749				103.5		1.4	0.009
51648.6097	6.5	7.1	-92.525		-0.6	99.1	99.6	1.3	1.5	0.004
51649.5000		12.3	-92.784				105.1		0.8	0.005
51650.5000		6.5	-93.098				99.6		1.2	0.006
51651.5000		3.2	-93.139				96.4		1.5	0.003
51652.5000		9.9	-93.020				102.9		1.6	0.005
51653.5000		18.7	-93.244				111.9		2.6	0.012
51654.5000		12.4	-93.272				105.7		2.2	0.011
51655.6098	1.8	14.4	-93.379		-12.6	95.2	107.8	0.8	1.7	0.005
51656.5000		15.0	-93.626				108.6		1.8	0.006
51657.5000		13.5	-94.005	- 71599.932 _{CP}			107.5		1.1	0.005
51658.6097	1.2	1.6	-94.332		-0.4	95.5	95.9	0.7	1.6	0.005
51659.5000		11.3							1.1	
51660.6097	1.4	6.2	-94.383	+ 71600.695 _{CP}	-4.8	95.8	100.6	0.9	1.0	0.008
51661.5000		1.3	-94.694				96.0		0.7	0.004
51662.5000		0.5	-95.875				96.3		0.9	0.013
51663.5000		12.6							1.5	

The **ADJUSTMENTS** column indicates any manual adjustments (e.g. calibration) that have been applied to either TW, CV, or CP data. In particular, since CP data is currently obtained from non-calibrated systems, arbitrary offsets are often applied to CP data to keep column widths small.

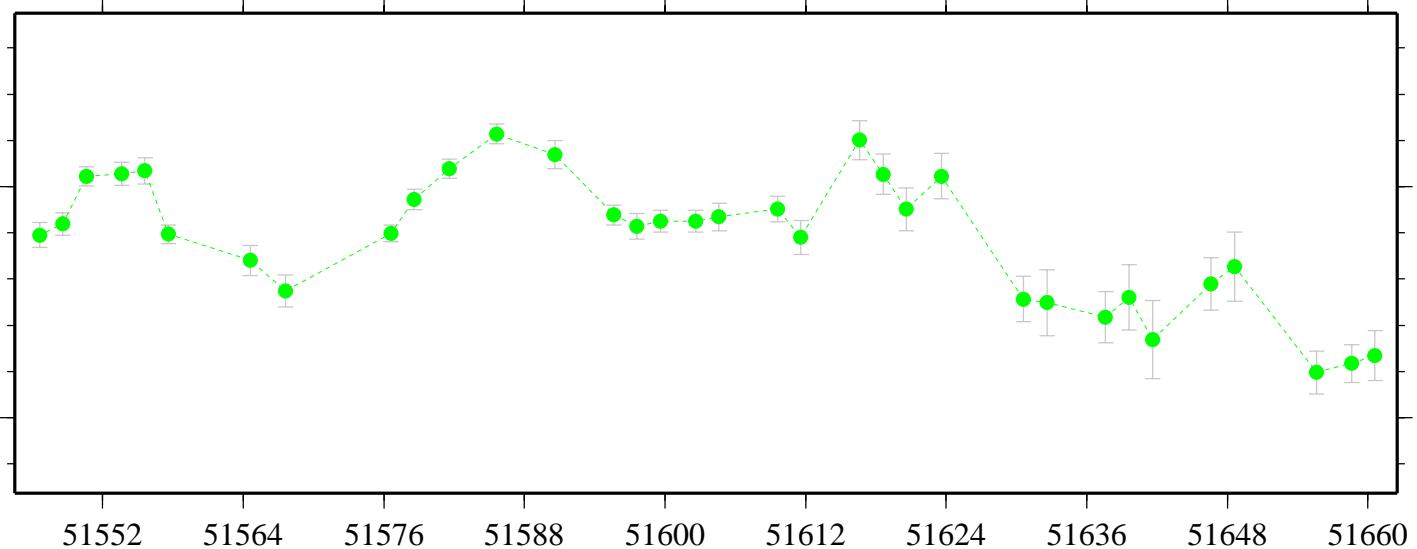
USNO(d)-NPL (TW-CV)

NANOSECONDS



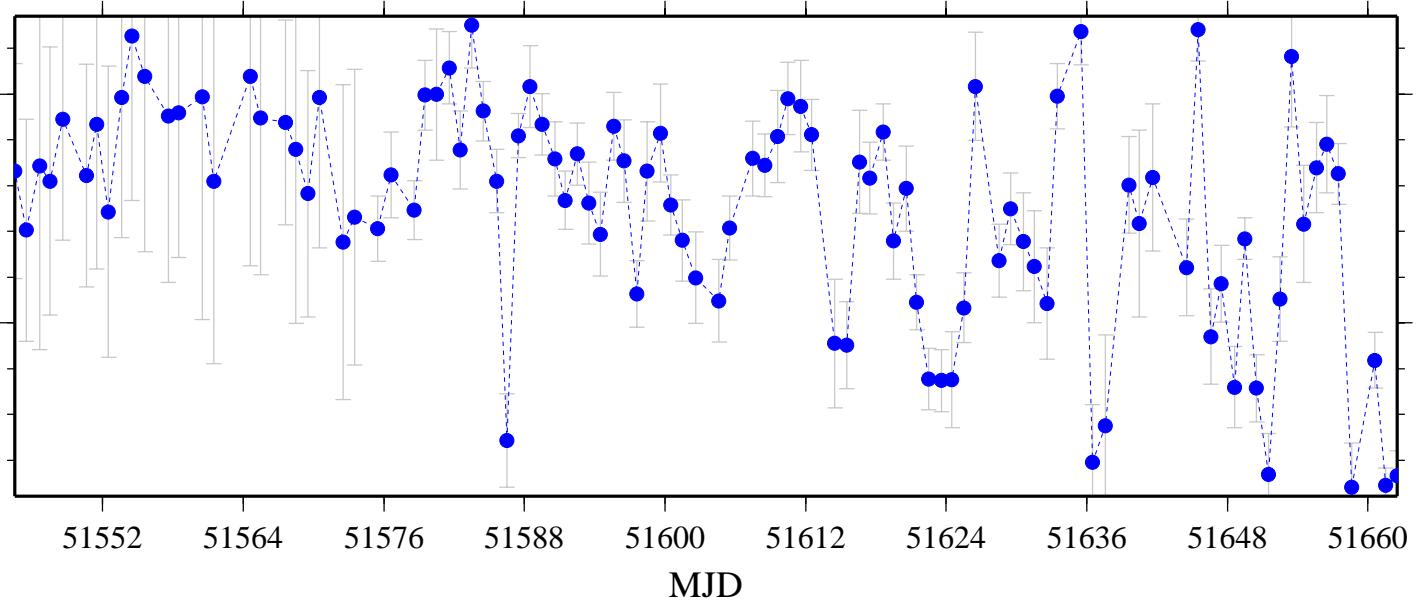
USNO(d)-NPL (TW-CP)

NANOSECONDS



USNO(d)-NPL (CV-CP)

NANOSECONDS



x and y-axes are same scale

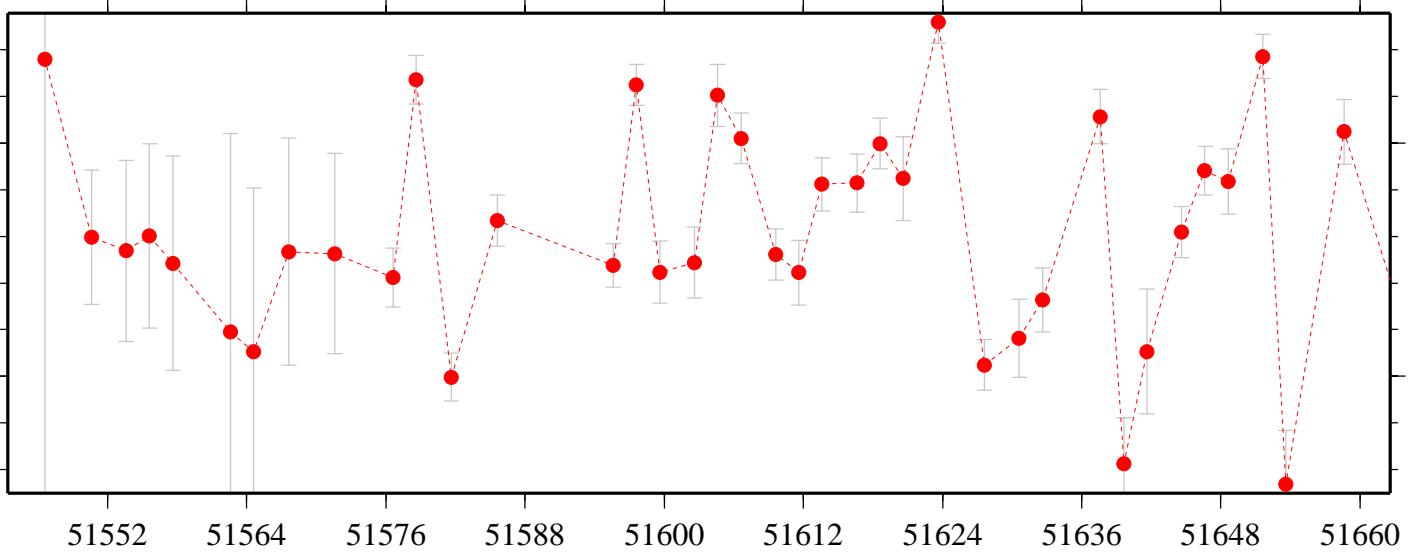
USNO(d) - PTB

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		21.3	42.060				-20.8		1.7	0.022
51636.5000		5.7	42.881				-37.2		1.7	0.014
51637.6160	4.7	3.4	44.878		1.3	-40.2	-41.5	0.5	1.2	0.021
51638.5000		10.8	45.293				-34.5		1.5	0.053
51639.6160	6.5	22.3	46.477		-15.8	-39.9	-24.1	0.4	2.2	0.302
51640.5000		19.4	44.624				-25.2		3.7	0.038
51641.6160	7.2	17.5	39.968		-10.3	-32.7	-22.4	0.5	3.0	0.039
51642.5000		3.8							1.0	
51643.5000		9.5							1.1	
51644.6160	5.6	10.0			-4.4			0.4	1.2	
51645.5000		18.1	41.892				-23.8		1.1	0.024
51646.6160	4.0	5.3			-1.4			0.4	1.1	
51647.5000		9.6							0.9	
51648.6160	6.7	8.6	40.896		-1.9	-34.2	-32.3	0.5	1.5	0.033
51649.5000		14.5	41.596				-27.1		0.8	0.020
51650.5000		8.3	40.947				-32.7		0.8	0.018
51651.6160	2.6	-1.6	40.551		4.3	-37.9	-42.2	0.6	0.9	0.016
51652.5000		11.0	41.344				-30.4		1.1	0.016
51653.6160	4.6	21.4	42.248		-16.8	-37.6	-20.8	0.5	2.6	0.027
51654.5000		10.8							1.2	
51655.5000		19.3							1.4	
51656.5000		16.8							1.6	
51657.5000		17.3							1.2	
51658.6160	4.1	3.6	42.276	- 0.350CP	0.6	-38.2	-38.7	0.6	1.5	0.022
51659.5000		14.4							0.9	
51660.5000		9.5	41.702				-32.2		0.8	0.013
51661.5000		5.6	40.348				-34.8		0.8	0.016
51662.6160	-0.9	5.9			-6.8			0.5	0.8	
51663.5000		14.4							1.2	

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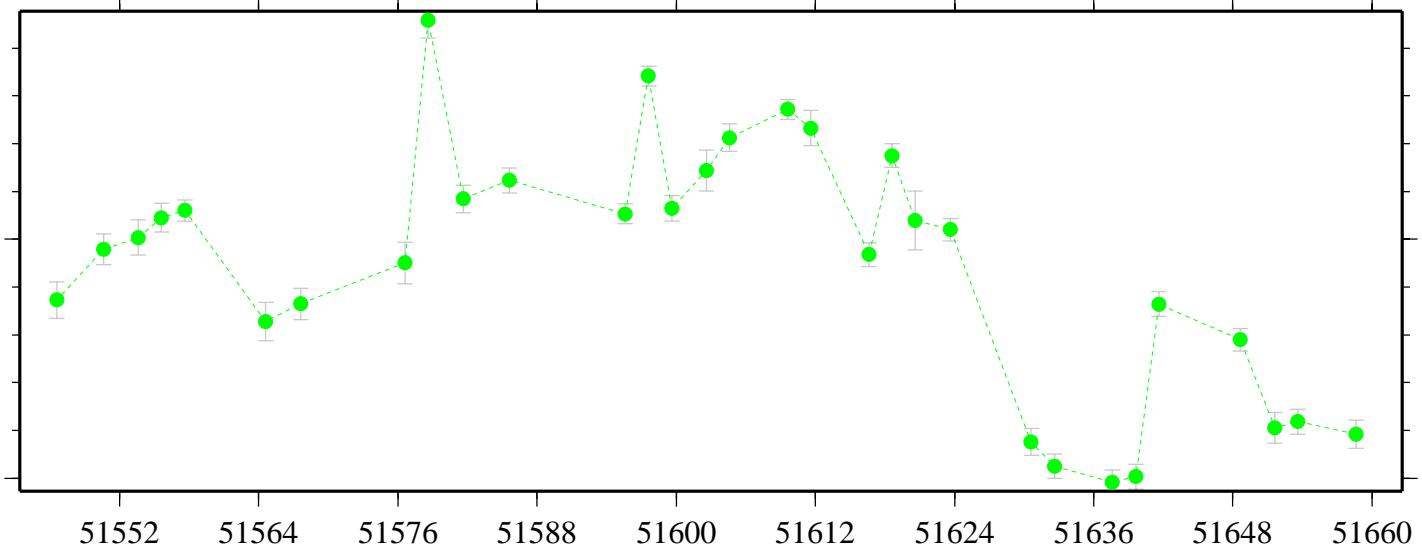
USNO(d)-PTB (TW-CV)

NANOSECONDS



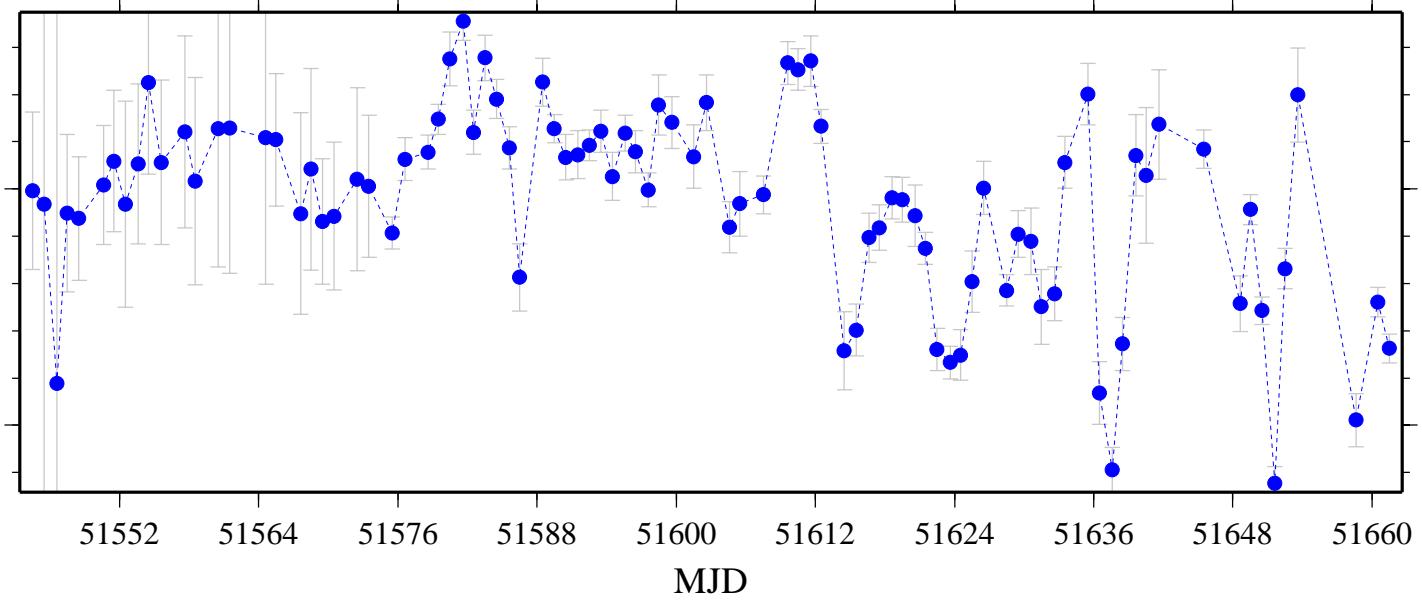
USNO(d)-PTB (TW-CP)

NANOSECONDS



USNO(d)-PTB (CV-CP)

NANOSECONDS



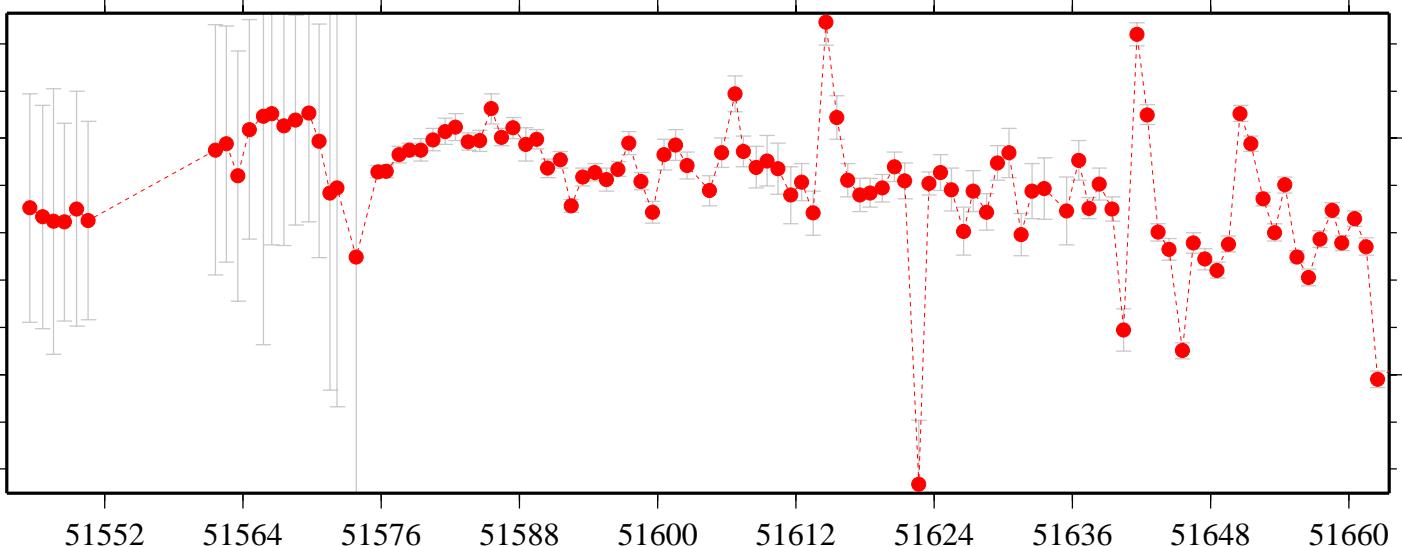
USNO(e) - AMC

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.4726	0.0	-56.9	2.227		56.9	-2.2	-59.1	0.1	1.4	0.004
51636.5351	-0.3	-59.4	-0.424		59.1	0.1	-58.9	0.1	0.8	Inf
51637.4525	-0.1	-57.1	2.467		57.0	-2.5	-59.6	0.2	0.4	0.005
51638.3469	-0.3	-58.4	2.543		58.1	-2.9	-60.9	0.2	0.7	0.006
51639.4719	0.0	-57.0	2.894	- 782.206CP	57.0	-2.9	-59.9	0.1	0.5	0.005
51640.4518	0.0	-51.9	5.280		51.9	-5.3	-57.2	0.1	0.9	0.711
51641.6200	0.5	-63.9	1.127		64.4	-0.6	-65.0	0.1	0.5	0.023
51642.4934	0.3	-60.7	2.472		61.0	-2.1	-63.1	0.1	0.4	0.006
51643.4522	0.2	-55.9	3.071		56.0	-2.9	-58.9	0.1	0.3	0.004
51644.3691	0.3	-55.0	3.078		55.3	-2.7	-58.0	0.2	0.4	0.004
51645.5347	0.8	-50.2	3.044		51.0	-2.3	-53.3	0.1	0.3	0.004
51646.4931	0.5	-55.1	2.890		55.6	-2.4	-58.0	0.1	0.4	0.003
51647.5143	0.3	-54.6	2.746		54.9	-2.4	-57.3	0.1	0.4	0.008
51648.5768	0.5	-53.9			54.4			0.1	0.3	
51649.5351	0.4	-55.1	2.654		55.5	-2.2	-57.8	0.1	0.3	0.003
51650.5768	0.6	-60.5	2.574		61.1	-2.0	-63.1	0.1	0.3	0.003
51651.4934	0.2	-59.5	2.991	+ 586.807CP	59.8	-2.8	-62.5	0.2	0.3	0.033
51652.5344	0.0	-57.5	4.005		57.4	-4.1	-61.5	0.1	0.3	0.004
51653.5344	0.3	-55.8	4.112		56.0	-3.8	-59.9	0.2	0.3	0.005
51654.4511	0.1	-57.9	3.964		58.0	-3.8	-61.9	0.2	0.3	0.005
51655.4934	0.3	-54.7	3.728		55.0	-3.4	-58.4	0.1	0.3	0.004
51656.5150	0.1	-54.0	9.055		54.1	-8.9	-63.0	0.1	0.3	Inf
51657.4927	0.4	-55.3	3.570		55.7	-3.1	-58.9	0.1	0.3	0.003
51658.5351	0.7	-56.2	3.386		56.9	-2.7	-59.6	0.2	0.3	0.003
51659.4094	1.2	-54.4	3.257		55.6	-2.1	-57.6	0.1	0.3	0.002
51660.4726	0.8	-55.8	3.135		56.6	-2.3	-58.9	0.1	0.3	0.002
51661.4740	0.4	-55.0	2.920		55.4	-2.5	-57.9	0.2	0.3	0.002
51662.4927	-0.2	-50.0	2.476		49.8	-2.6	-52.4	0.1	0.3	0.003
51663.5139	0.1	-50.1			50.2			0.1	0.3	

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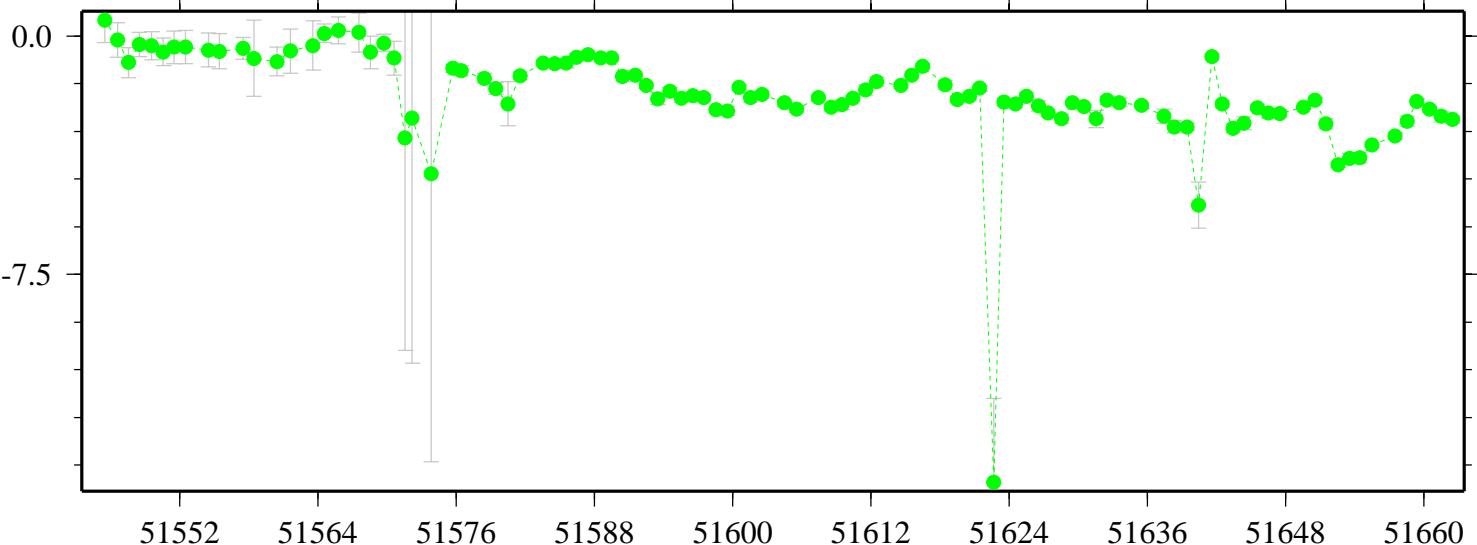
USNO(e)-AMC (TW-CV)

NANOSECONDS



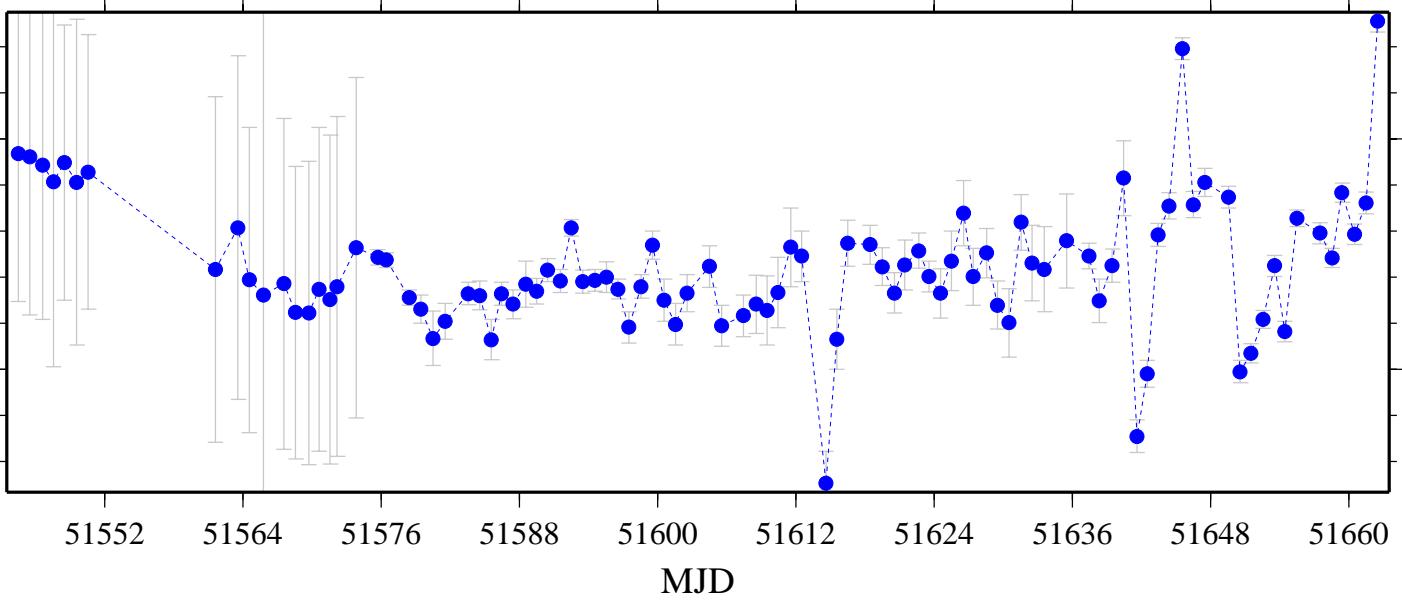
USNO(e)-AMC (TW-CP)

NANOSECONDS



USNO(e)-AMC (CV-CP)

NANOSECONDS



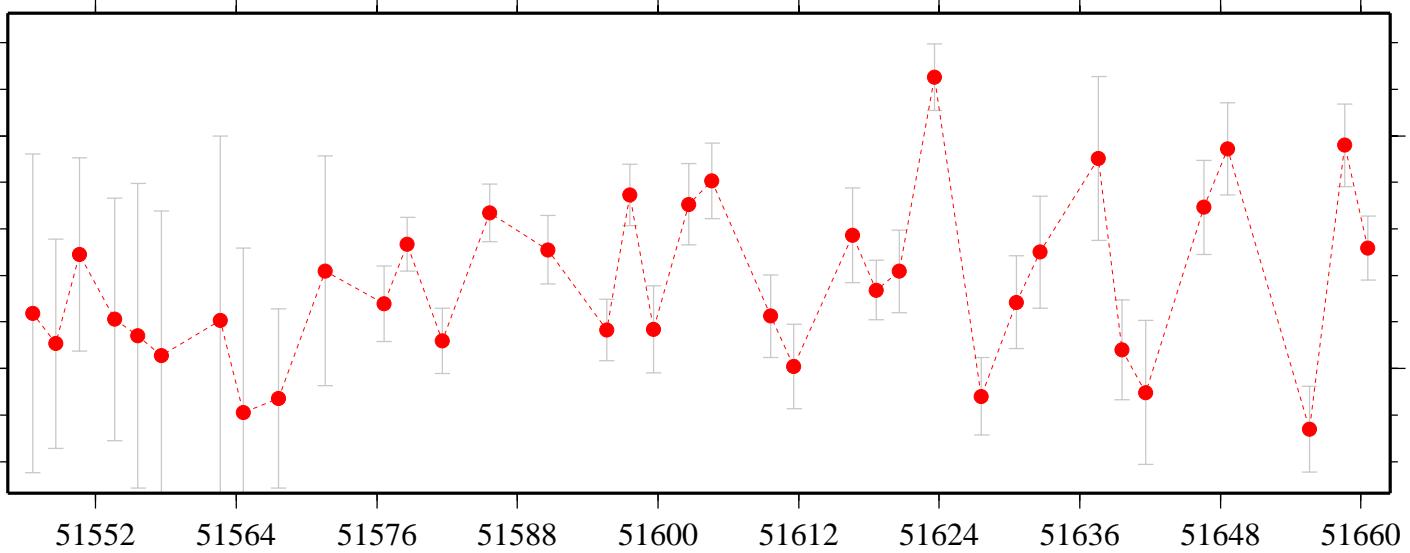
USNO(f) - NPL

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		34.5	-75.366				109.9		1.3	0.006
51636.5000		17.7							2.1	
51637.6097	16.6	17.6	-77.435		-1.0	94.0	95.0	0.9	3.4	0.006
51638.5000		18.0							2.0	
51639.6097	15.1	24.3	-80.162		-9.2	95.2	104.4	1.2	1.8	0.008
51640.5000		21.6	-81.410				103.0		3.5	0.283
51641.6097	11.0	22.0	-83.353		-11.0	94.4	105.4	1.4	2.7	0.033
51642.5000		11.1	-83.029				94.1		1.9	0.013
51643.5000		13.2	-84.009				97.2		1.5	0.011
51644.5000		14.8	-85.553				100.3		1.8	0.006
51645.5000		22.7	-86.590				109.3		1.2	0.005
51646.6100	7.5	10.6	-87.418		-3.1	94.9	98.0	1.0	1.8	0.004
51647.5000		11.7	-87.996				99.7		1.4	0.007
51648.6097	6.5	7.1	-88.526		-0.6	95.1	95.6	1.3	1.5	0.005
51649.5000		12.3	-88.879				101.2		0.8	0.005
51650.5000		6.5	-89.375				95.9		1.2	0.007
51651.5000		3.2	-89.147				92.4		1.5	0.019
51652.5000		9.9	-88.554				98.4		1.6	0.005
51653.5000		18.7	-88.973				107.6		2.6	0.014
51654.5000		12.4	-89.273				101.7		2.2	0.012
51655.6098	1.8	14.4	-89.702		-12.6	91.5	104.1	0.8	1.7	0.006
51656.5000		15.0	-89.968				105.0		1.8	0.006
51657.5000		13.5	-90.491	- 71600.002CP			104.0		1.1	0.006
51658.6097	1.2	1.6	-91.012		-0.4	92.2	92.6	0.7	1.6	0.007
51659.5000		11.3	-91.294				102.6		1.1	0.004
51660.6097	1.4	6.2	-91.600	+ 71600.714CP	-4.8	93.0	97.8	0.9	1.0	0.005
51661.5000		1.3	-92.040				93.3		0.7	0.005
51662.5000		0.5	-92.713				93.2		0.9	0.016
51663.5000		12.6							1.5	

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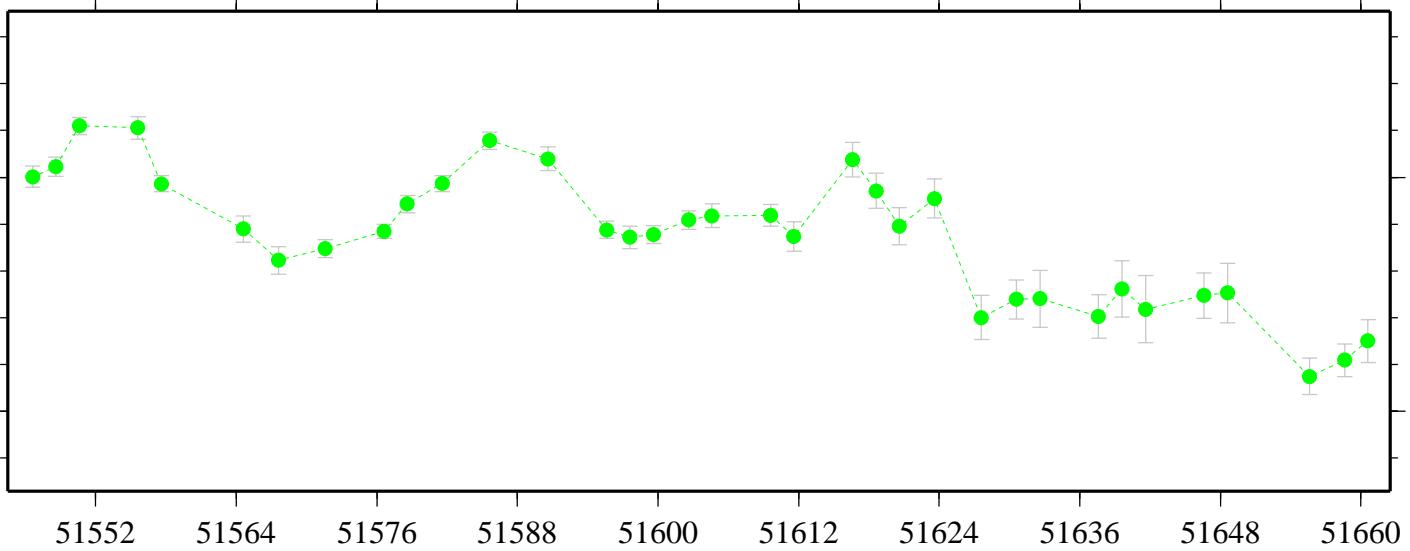
USNO(f)-NPL (TW-CV)

NANOSECONDS



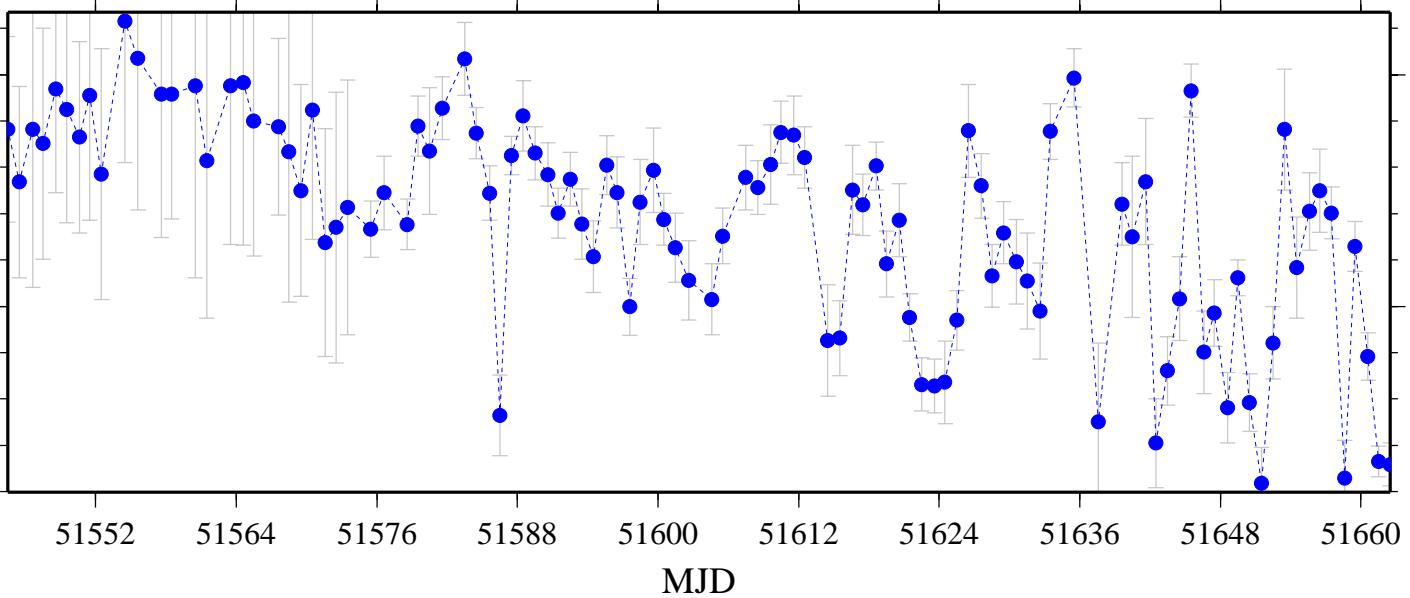
USNO(f)-NPL (TW-CP)

NANOSECONDS



USNO(f)-NPL (CV-CP)

NANOSECONDS



x and y-axes are same scale

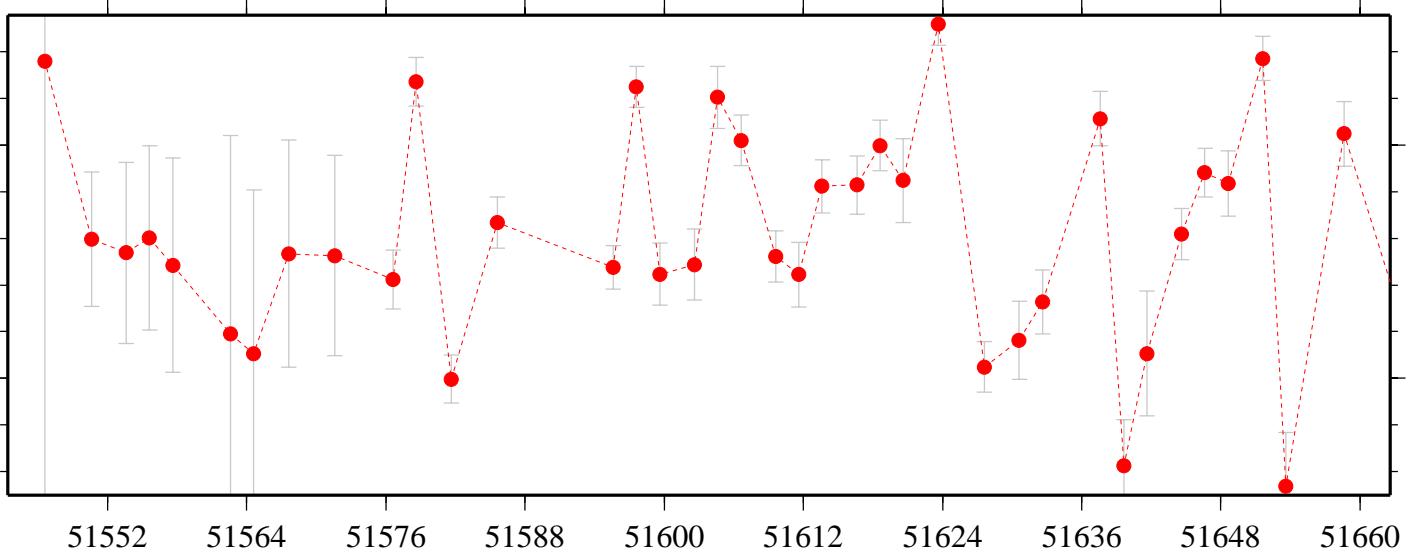
USNO(f) - PTB

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		21.3	44.967				-23.7		1.7	0.022
51636.5000		5.7							1.7	
51637.6160	4.7	3.4	47.114		1.3	-42.4	-43.7	0.5	1.2	0.018
51638.5000		10.8	47.561				-36.8		1.5	0.045
51639.6160	6.5	22.3	49.322		-15.8	-42.8	-27.0	0.4	2.2	0.030
51640.5000		19.4	36.960				-17.6		3.7	0.184
51641.6160	7.2	17.5	40.238		-10.3	-33.0	-22.7	0.5	3.0	0.037
51642.5000		3.8							1.0	
51643.5000		9.5							1.1	
51644.6160	5.6	10.0			-4.4			0.4	1.2	
51645.5000		18.1	44.298				-26.2		1.1	0.024
51646.6160	4.0	5.3			-1.4			0.4	1.1	
51647.5000		9.6							0.9	
51648.6160	6.7	8.6	43.681		-1.9	-37.0	-35.1	0.5	1.5	0.032
51649.5000		14.5	44.335				-29.9		0.8	0.020
51650.5000		8.3	43.538				-35.3		0.8	0.018
51651.6160	2.6	-1.6	43.762		4.3	-41.1	-45.4	0.6	0.9	0.019
51652.5000		11.0	44.963				-34.0		1.1	0.016
51653.6160	4.6	21.4	45.786		-16.8	-41.2	-24.4	0.5	2.6	0.028
51654.5000		10.8							1.2	
51655.5000		19.3							1.4	
51656.5000		16.8							1.6	
51657.5000		17.3							1.2	
51658.6160	4.1	3.6	45.626	- 0.345 CP	0.6	-41.5	-42.1	0.6	1.5	0.020
51659.5000		14.4	44.489				-30.0		0.9	0.012
51660.5000		9.5	44.056				-34.6		0.8	0.013
51661.5000		5.6	42.642				-37.1		0.8	0.016
51662.6160	-0.9	5.9			-6.8			0.5	0.8	
51663.5000		14.4							1.2	

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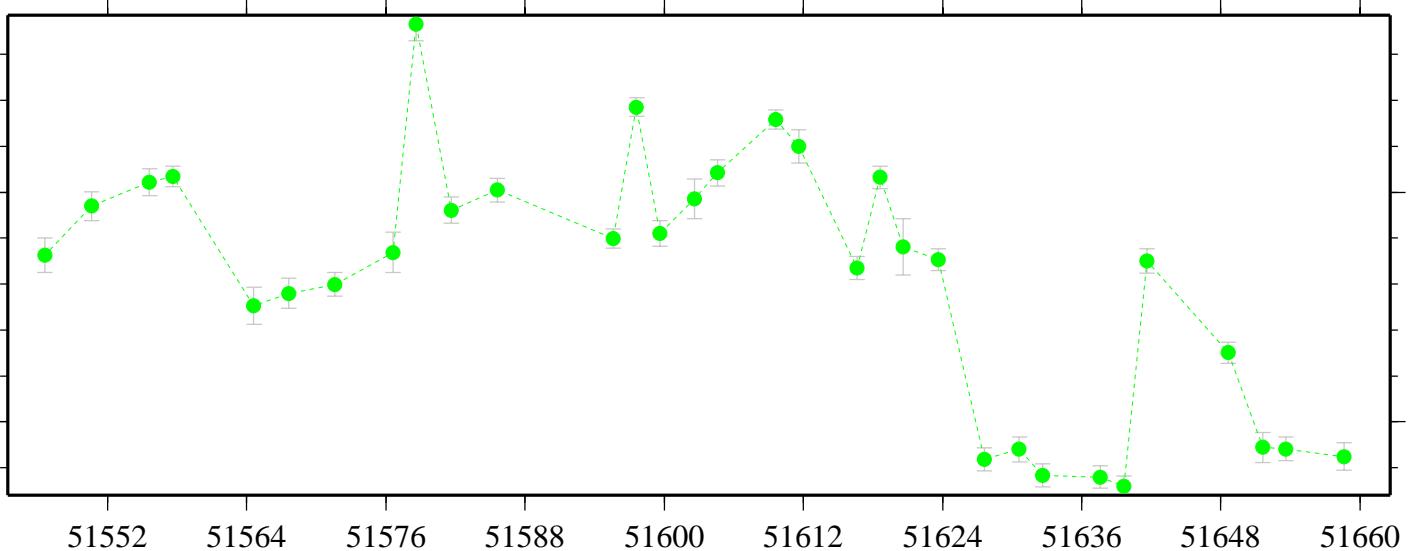
USNO(f)-PTB (TW-CV)

NANOSECONDS



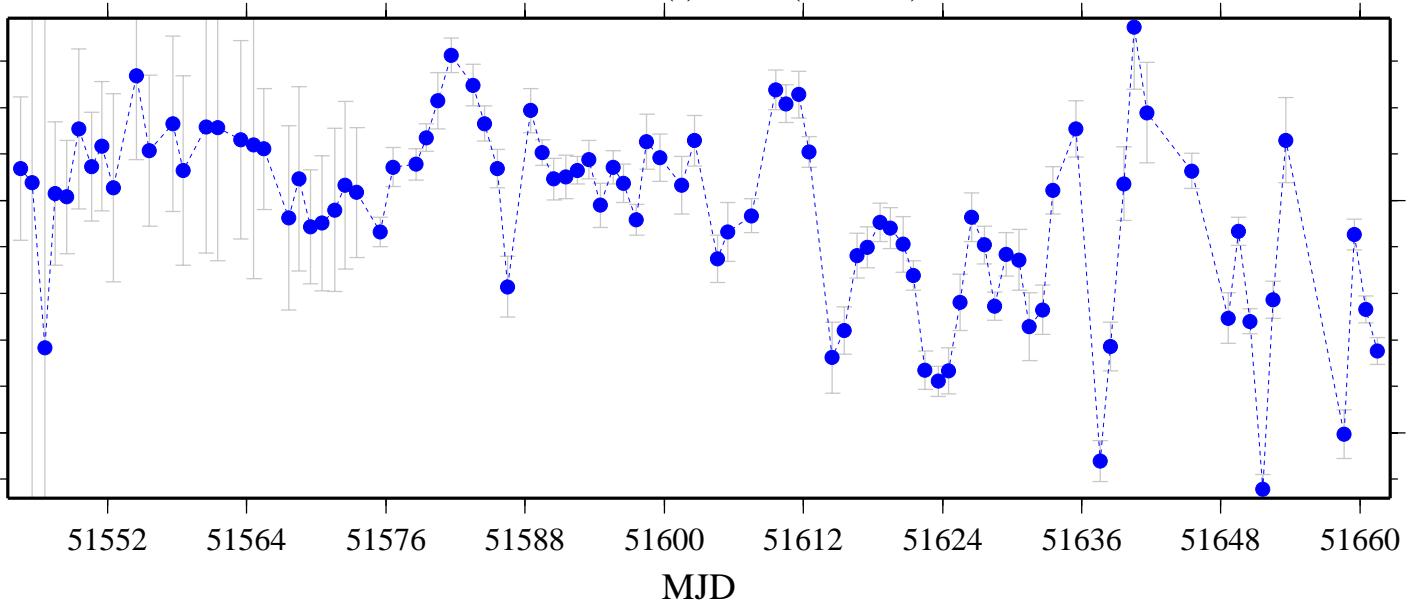
USNO(f)-PTB (TW-CP)

NANOSECONDS



USNO(f)-PTB (CV-CP)

NANOSECONDS



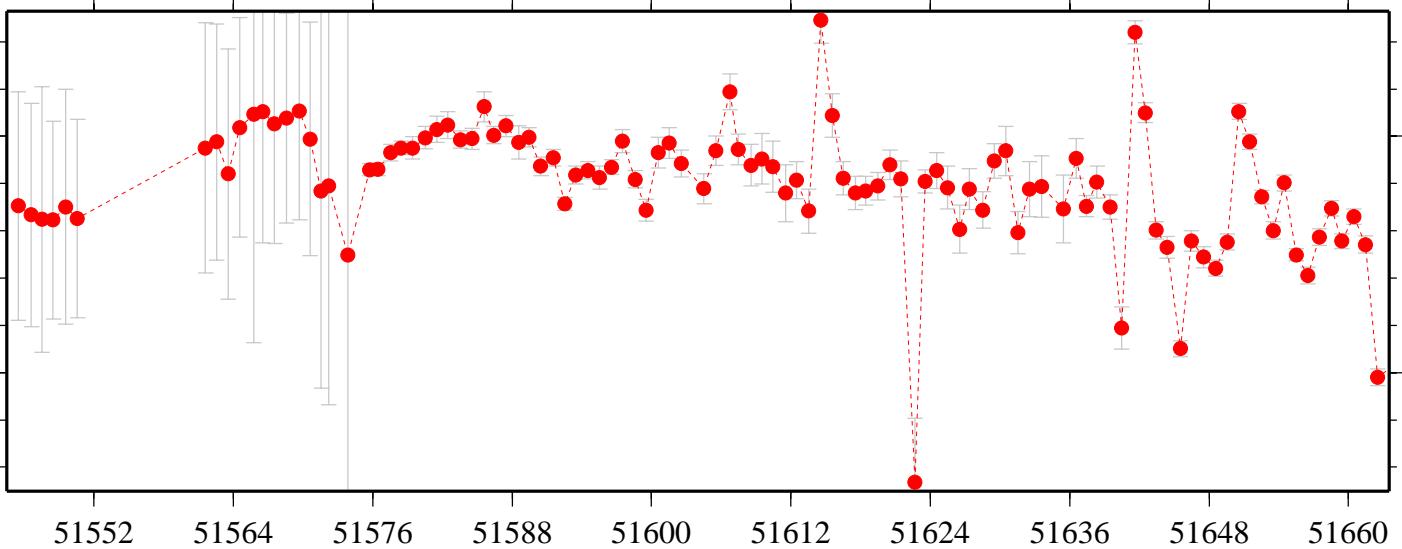
USNO(g) - AMC

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.4726	0.0	-56.9	1.557		56.9	-1.5	-58.4	0.1	1.4	0.007
51636.5351	-0.3	-59.4	-4.316		59.1	4.0	-55.0	0.1	0.8	Inf
51637.4525	-0.1	-57.1	1.843		57.0	-1.9	-58.9	0.2	0.4	0.005
51638.3469	-0.3	-58.4	1.935		58.1	-2.3	-60.3	0.2	0.7	0.006
51639.4719	0.0	-57.0	2.506	- 782.241CP	57.0	-2.5	-59.5	0.1	0.5	0.008
51640.4518	0.0	-51.9	2.235		51.9	-2.3	-54.2	0.1	0.9	0.009
51641.6200	0.5	-63.9	1.055		64.4	-0.6	-65.0	0.1	0.5	0.018
51642.4934	0.3	-60.7	2.019		61.0	-1.7	-62.7	0.1	0.4	0.016
51643.4522	0.2	-55.9	2.707		56.0	-2.5	-58.6	0.1	0.3	0.007
51644.3691	0.3	-55.0	2.710		55.3	-2.4	-57.7	0.2	0.4	0.007
51645.5347	0.8	-50.2	2.557		51.0	-1.8	-52.8	0.1	0.3	0.006
51646.4931	0.5	-55.1	2.460		55.6	-2.0	-57.6	0.1	0.4	0.004
51647.5143	0.3	-54.6	2.340		54.9	-2.0	-56.9	0.1	0.4	0.010
51648.5768	0.5	-53.9			54.4			0.1	0.3	
51649.5351	0.4	-55.1	2.171		55.5	-1.8	-57.3	0.1	0.3	0.006
51650.5768	0.6	-60.5	2.049		61.1	-1.5	-62.6	0.1	0.3	0.006
51651.4934	0.2	-59.5	2.053	+ 586.723CP	59.8	-1.8	-61.6	0.2	0.3	0.040
51652.5344	0.0	-57.5	3.554		57.4	-3.6	-61.0	0.1	0.3	0.004
51653.5344	0.3	-55.8	3.649		56.0	-3.4	-59.4	0.2	0.3	0.007
51654.4511	0.1	-57.9	3.329		58.0	-3.2	-61.2	0.2	0.3	0.013
51655.4934	0.3	-54.7	2.841		55.0	-2.5	-57.5	0.1	0.3	0.006
51656.5150	0.1	-54.0	5.352		54.1	-5.2	-59.3	0.1	0.3	Inf
51657.4927	0.4	-55.3	2.936		55.7	-2.5	-58.2	0.1	0.3	0.004
51658.5351	0.7	-56.2	2.668		56.9	-2.0	-58.9	0.2	0.3	0.005
51659.4094	1.2	-54.4	2.530		55.6	-1.3	-56.9	0.1	0.3	0.003
51660.4726	0.8	-55.8	2.551		56.6	-1.7	-58.3	0.1	0.3	0.004
51661.4740	0.4	-55.0	2.316		55.4	-1.9	-57.3	0.2	0.3	0.004
51662.4927	-0.2	-50.0	1.760		49.8	-1.9	-51.7	0.1	0.3	0.003
51663.5139	0.1	-50.1			50.2			0.1	0.3	

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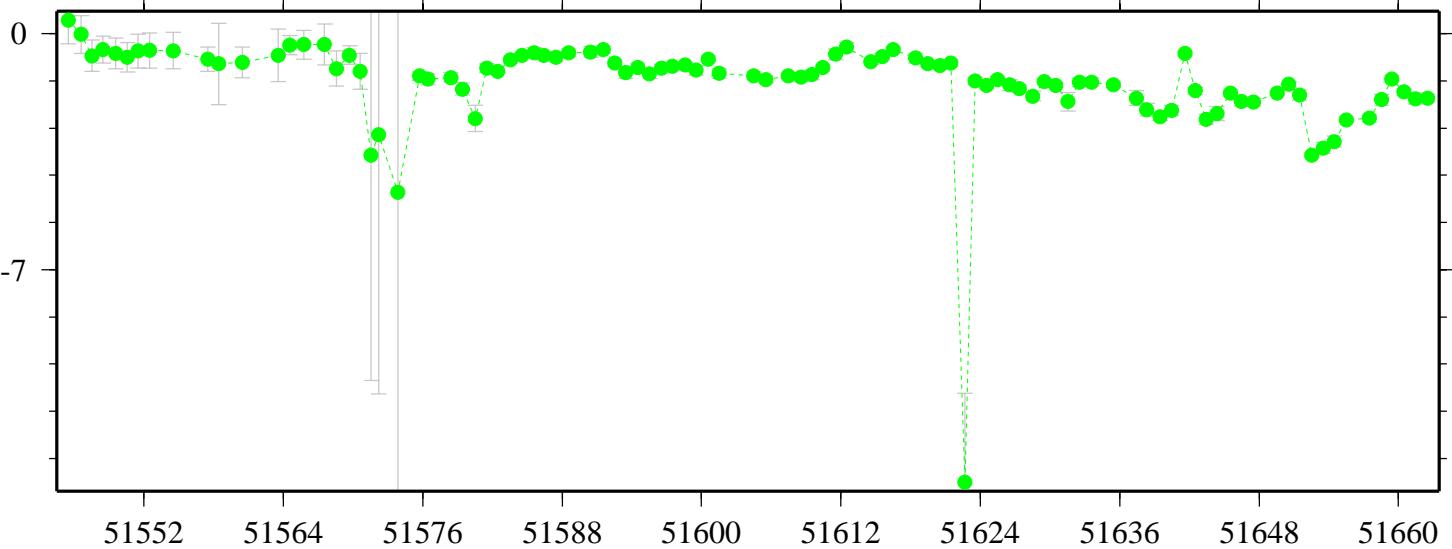
USNO(g)-AMC (TW-CV)

NANOSECONDS



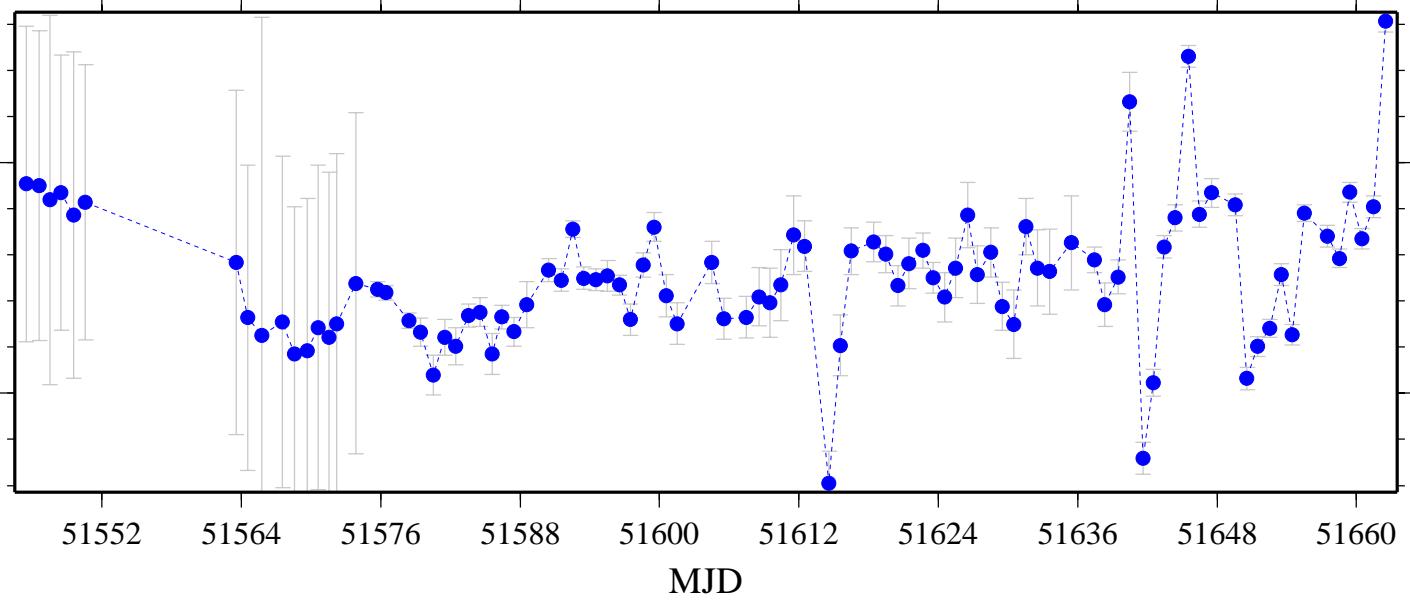
USNO(g)-AMC (TW-CP)

NANOSECONDS



USNO(g)-AMC (CV-CP)

NANOSECONDS



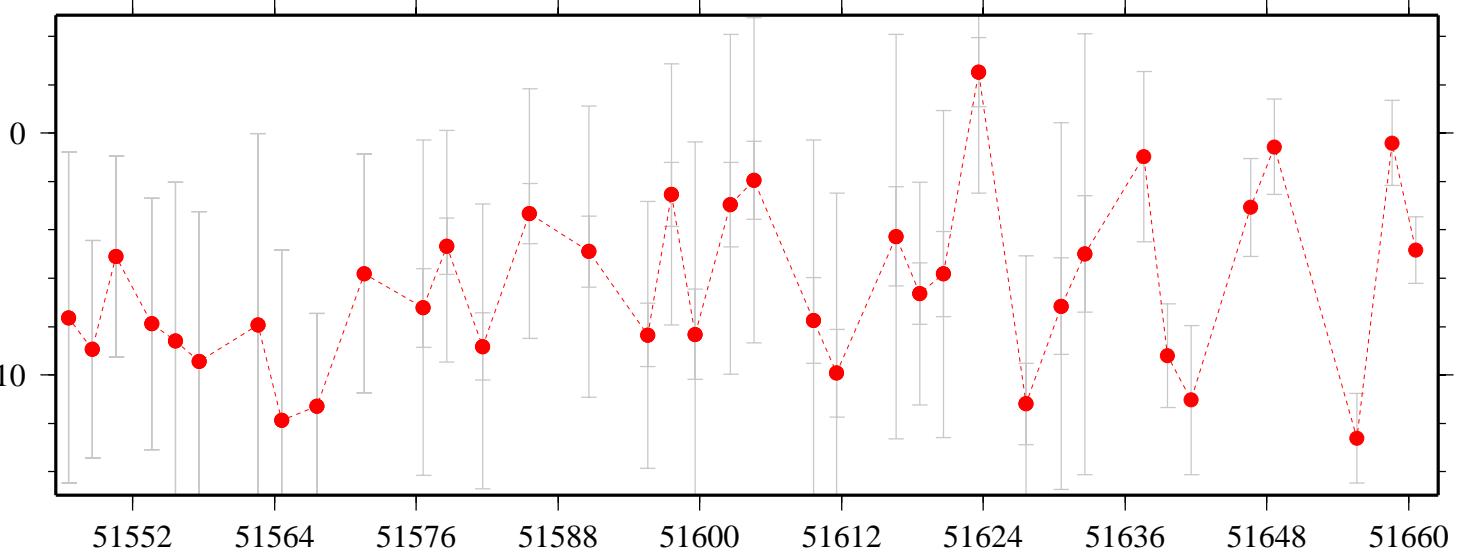
USNO(h) - NPL

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		34.5	-75.692				110.2		1.3	0.009
51636.5000		17.7							2.1	
51637.6097	16.6	17.6	-77.724		-1.0	94.3	95.3	0.9	3.4	0.006
51638.5000		18.0							2.0	
51639.6097	15.1	24.3	-80.194		-9.2	95.3	104.5	1.2	1.8	0.011
51640.5000		21.6	-81.320				102.9		3.5	0.012
51641.6097	11.0	22.0	-82.953		-11.0	94.0	105.0	1.4	2.7	0.024
51642.5000		11.1	-83.316				94.4		1.9	0.012
51643.5000		13.2	-83.990				97.2		1.5	0.014
51644.5000		14.8	-85.568				100.3		1.8	0.010
51645.5000		22.7	-86.694				109.4		1.2	0.006
51646.6100	7.5	10.6	-87.458		-3.1	95.0	98.1	1.0	1.8	0.006
51647.5000		11.7	-88.017				99.7		1.4	0.007
51648.6097	6.5	7.1	-88.571		-0.6	95.1	95.7	1.3	1.5	0.008
51649.5000		12.3	-88.979				101.3		0.8	0.008
51650.5000		6.5	-89.511				96.0		1.2	0.008
51651.5000		3.2	-89.304				92.5		1.5	0.023
51652.5000		9.9	-88.535				98.4		1.6	0.005
51653.5000		18.7	-88.961				107.6		2.6	0.015
51654.5000		12.4	-89.472				101.9		2.2	0.018
51655.6098	1.8	14.4	-90.095		-12.6	91.9	104.5	0.8	1.7	0.006
51656.5000		15.0	-90.164				105.2		1.8	0.007
51657.5000		13.5	-90.626	- 71599.902CP			104.2		1.1	0.006
51658.6097	1.2	1.6	-91.184		-0.4	92.4	92.8	0.7	1.6	0.009
51659.5000		11.3	-91.435				102.7		1.1	0.004
51660.6097	1.4	6.2	-91.637	+ 71600.719CP	-4.8	93.0	97.9	0.9	1.0	0.006
51661.5000		1.3	-92.074				93.3		0.7	0.007
51662.5000		0.5	-92.859				93.3		0.9	0.016
51663.5000		12.6							1.5	

The **ADJUSTMENTS** column indicates any manual adjustments (e.g. calibration) that have been applied to either TW, CV, or CP data. In particular, since CP data is currently obtained from non-calibrated systems, arbitrary offsets are often applied to CP data to keep column widths small.

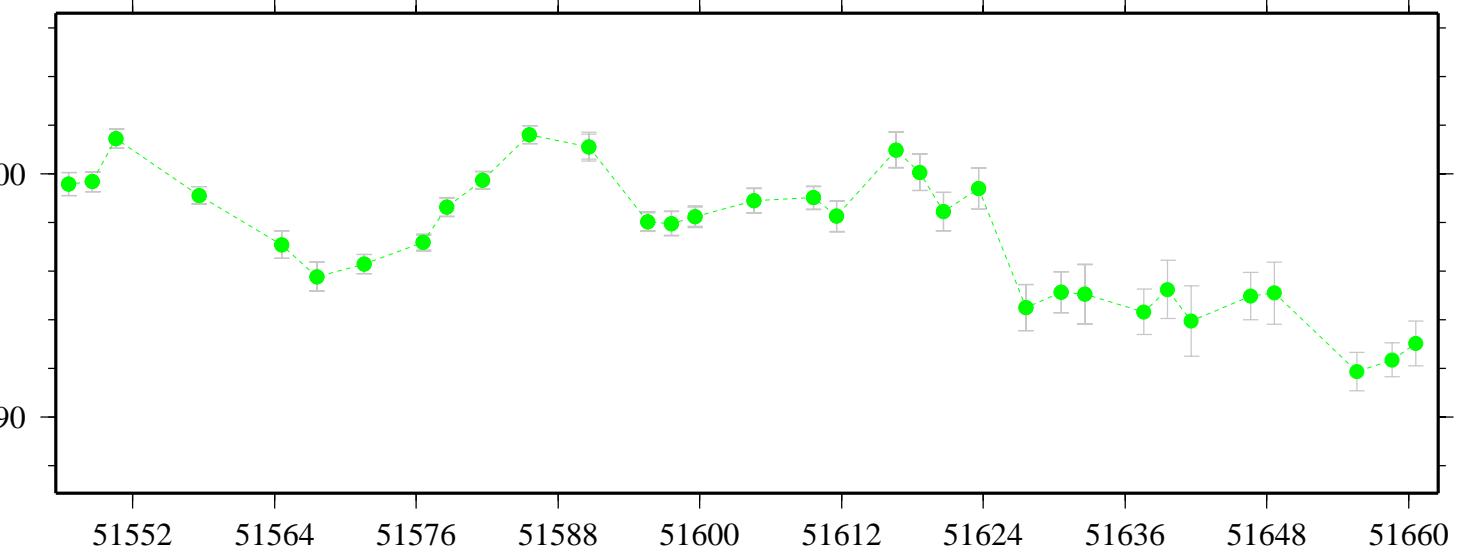
USNO(h)-NPL (TW-CV)

NANOSECONDS



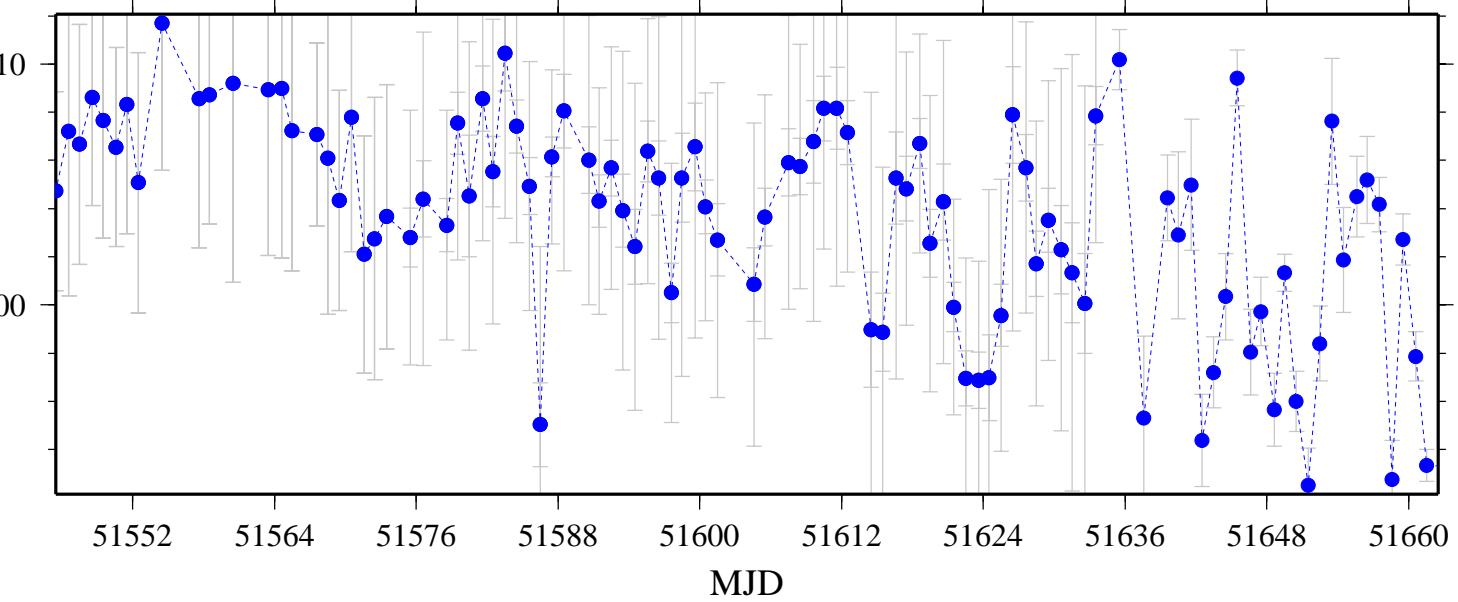
USNO(h)-NPL (TW-CP)

NANOSECONDS



USNO(h)-NPL (CV-CP)

NANOSECONDS



x and y-axes are same scale

USNO(h) - PTB

	TIME TRANS. 1-DAY AVE. (ns)			ADJUSTMENTS (ns)	TIME TRANS. DIFFERENCES (ns)			RMS SCATTER OF DAILY LINEAR FIT (ns)		
MJD	TW	CV	CP		TW-CV	TW-CP	CV-CP	TW	CV	CP
51635.5000		21.3	44.356				-23.1		1.7	0.022
51636.5000		5.7							1.7	
51637.6160	4.7	3.4	46.468		1.3	-41.8	-43.1	0.5	1.2	0.019
51638.5000		10.8	46.995				-36.2		1.5	0.044
51639.6160	6.5	22.3	48.934		-15.8	-42.4	-26.6	0.4	2.2	0.033
51640.5000		19.4	46.396				-27.0		3.7	0.047
51641.6160	7.2	17.5	41.241		-10.3	-34.0	-23.7	0.5	3.0	0.040
51642.5000		3.8							1.0	
51643.5000		9.5							1.1	
51644.6160	5.6	10.0			-4.4			0.4	1.2	
51645.5000		18.1	43.838				-25.8		1.1	0.024
51646.6160	4.0	5.3			-1.4			0.4	1.1	
51647.5000		9.6							0.9	
51648.6160	6.7	8.6	43.279		-1.9	-36.6	-34.7	0.5	1.5	0.029
51649.5000		14.5	43.879				-29.4		0.8	0.021
51650.5000		8.3	43.046				-34.8		0.8	0.016
51651.6160	2.6	-1.6	43.271		4.3	-40.6	-44.9	0.6	0.9	0.020
51652.5000		11.0	44.625				-33.7		1.1	0.016
51653.6160	4.6	21.4	45.415		-16.8	-40.8	-24.0	0.5	2.6	0.030
51654.5000		10.8							1.2	
51655.5000		19.3							1.4	
51656.5000		16.8							1.6	
51657.5000		17.3							1.2	
51658.6160	4.1	3.6	44.340	- 1.001 CP	0.6	-40.2	-40.8	0.6	1.5	0.022
51659.5000		14.4	43.236				-28.8		0.9	0.013
51660.5000		9.5	42.923				-33.4		0.8	0.014
51661.5000		5.6	41.491				-35.9		0.8	0.015
51662.6160	-0.9	5.9			-6.8			0.5	0.8	
51663.5000		14.4							1.2	

The **ADJUSTMENTS** column indicates any manual adjustments (e.g. calibration) that have been applied to either TW, CV, or CP data. In particular, since CP data is currently obtained from non-calibrated systems, arbitrary offsets are often applied to CP data to keep column widths small.

USNO(h)-PTB (TW-CV)

NANOSECONDS

0.0

-11.5

51552 51564 51576 51588 51600 51612 51624 51636 51648 51660

USNO(h)-PTB (TW-CP)

NANOSECONDS

-40

51552 51564 51576 51588 51600 51612 51624 51636 51648 51660

USNO(h)-PTB (CV-CP)

NANOSECONDS

-40.5

-27.0

51552 51564 51576 51588 51600 51612 51624 51636 51648 51660

MJD

AMC	Receiver System Hardware Information:
TW	<p>modem model: AOATWT-1000 antenna: 1.8m-VSAT reference standard name: UTC(USNOAMC(MC1)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>NOTES:</p>
CV	<p>receiver name (local): AOA2 SN113 receiver model: AOA-TTR4P antenna: XXX reference standard name: UTC(USNOAMC(MC1)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>AOA2 calibration history:</p> <p>NOTES: Receiver not calibrated.</p>
CP	<p>receiver name (local): AMC2 receiver model: AOA SNR-12 ACT antenna: AOAD-M_T reference standard name: UTC(USNOAMC(MC1)) reference standard type: steered H-MASER</p> <p>LOGS:</p> <p>51648 05-Apr-99 internal clock reset by ~780 ns at ~11:00: 51651 no apparent data loss</p> <p>NOTES:</p> <p>This is an IGS station (AMC2).</p>

NPL	Receiver System Hardware Information:
TW	<p>modem model: SATRE antenna: 1.8m-VSAT reference standard name: UTC(NPL) reference standard type: H-MASER</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): xxx SN276 receiver model: AOA-TTR5A antenna: XXX reference standard name: UTC(NPL) reference standard type: H-MASER</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p> <p>This receiver system has an arbitrary fixed offset from UTC(NPL) which has not been measured.</p>
CP	<p>receiver name (local): NPLB receiver model: Ashtech Z-XII3 antenna: ASH700718B reference standard name: UTC(NPL) reference standard type: H-MASER</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p> <p>This receiver system has a fixed offset of UTC(NPL)-1pps_input = (8441+/-1)ns, subject to temperature variations on the 200m cable joining two buildings.</p>

PTB	Receiver System Hardware Information:
TW	<p>modem model: SATRE antenna: 1.8m-VSAT reference standard name: UTC(PTB) reference standard type: CESIUM(steered)</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): xxx xxx receiver model: AOA-TTR5 antenna: XXX reference standard name: UTC(PTB) reference standard type: CESIUM(steered)</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CP	<p>receiver name (local): PTBA receiver model: modified Ashtech Z-12T GeTT terminal antenna: choke-ring reference standard name: H2 reference standard type: H-MASER</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p> <p>This is a GeTT receiver. CP clock estimates at PTB are referenced to UTC(PTB) using data from an SRS620 time interval counter.</p>

USNO(a)	Receiver System Hardware Information:
TW	<p>modem model: EACS-TWSTT-2000(sn#103) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>NOTES:</p>
CV	<p>receiver name (local): AOA1 SN12 receiver model: AOA-TTR4P antenna: XXX reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>AOA1 calibration history:</p> <p>NOTES: Receiver not calibrated.</p>
CP	<p>receiver name (local): USNO receiver model: AOA SNR-12 ACT antenna: AOAD-M_T reference standard name: UTC(USNO(MC3)) reference standard type: steered H-MASER</p> <p>LOGS:</p> <p>NOTES: CP clock estimates are referenced to UTC(USNO(MC2)) using data from an optic fiber link.</p>

USNO(b)	Receiver System Hardware Information:
TW	<p>modem model: Mitrex-2500(sn#85006) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p>
	<p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): TTR1 SN440 receiver model: AOA-TTR6 antenna: xxx reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p>
	<p><u>LOGS:</u></p> <p>TTR1 calibration history: TTR1(SN440) delay change on MJD 50566 (04/28/97): Internal=68 TTR1(SN440) delay change on MJD 50973 (06/09/98): Internal=67 TTR1(SN440) delay change on MJD 51135 (11/18/98): Internal=68 TTR1(SN440) delay change on MJD 51260 (03/23/99): Internal=67</p> <p><u>NOTES:</u> This is the primary USNO SPS receiver.</p>
CP	<p>receiver name (local): USNO receiver model: AOA SNR-12 ACT antenna: AOAD-M_T reference standard name: UTC(USNO(MC3)) reference standard type: steered H-MASER</p>
	<p><u>LOGS:</u></p> <p><u>NOTES:</u></p> <p>CP clock estimates are referenced to UTC(USNO(MC2)) using data from an optic fiber link.</p>

USNO(c)	Receiver System Hardware Information:
TW	<p>modem model: EACS-TWSTT-2000(sn#103) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): AOA1 SNxxx receiver model: AOA-TTR4P antenna: XXX reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p><u>LOGS:</u></p> <p>AOA1 calibration history:</p> <p><u>NOTES:</u> Receiver not calibrated.</p>
CP	<p>receiver name (local): USNB receiver model: modified Ashtech Z-12T GeTT terminal antenna: reference standard name: UTC(USNO(MC2)) reference standard type: steered H-MASER</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u> This is a GeTT receiver.</p>

USNO(d)	Receiver System Hardware Information:
TW	<p>modem model: Mitrex-2500(sn#85006) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steeded)</p>
	<p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): TTR1 SN440 receiver model: AOA-TTR6 antenna: xxx reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steeded)</p>
	<p><u>LOGS:</u></p> <p>TTR1 calibration history: TTR1(SN440) delay change on MJD 50566 (04/28/97): Internal=68 TTR1(SN440) delay change on MJD 50973 (06/09/98): Internal=67 TTR1(SN440) delay change on MJD 51135 (11/18/98): Internal=68 TTR1(SN440) delay change on MJD 51260 (03/23/99): Internal=67</p> <p><u>NOTES:</u> This is the primary USNO SPS receiver.</p>
CP	<p>receiver name (local): USNB receiver model: modified Ashtech Z-12T GeTT terminal antenna: reference standard name: UTC(USNO(MC2)) reference standard type: steered H-MASER</p>
	<p><u>LOGS:</u></p> <p><u>NOTES:</u> This is a GeTT receiver.</p>

USNO(e)	Receiver System Hardware Information:
TW	<p>modem model: EACS-TWSTT-2000(sn#103) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>NOTES:</p>
CV	<p>receiver name (local): AOA1 SNxxx receiver model: AOA-TTR4P antenna: XXX reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>AOA1 calibration history:</p> <p>NOTES: Receiver not calibrated.</p>
CP	<p>receiver name (local): NIM1 receiver model: Ashtech Z-12 antenna: Geodetic 3 reference standard name: UTC(USNO(MC2)) reference standard type: steered H-MASER</p> <p>LOGS:</p> <p>NOTES:</p> <p>This receiver is owned by the National Imagery and Mapping Agency (NIMA)</p>

USNO(f)	Receiver System Hardware Information:
TW	<p>modem model: Mitrex-2500(sn#85006) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): TTR1 SN440 receiver model: AOA-TTR6 antenna: XXX reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p><u>LOGS:</u></p> <p>TTR1 calibration history: TTR1(SN440) delay change on MJD 50566 (04/28/97): Internal=68 TTR1(SN440) delay change on MJD 50973 (06/09/98): Internal=67 TTR1(SN440) delay change on MJD 51135 (11/18/98): Internal=68 TTR1(SN440) delay change on MJD 51260 (03/23/99): Internal=67</p> <p><u>NOTES:</u> This is the primary USNO SPS receiver.</p>
CP	<p>receiver name (local): NIM1 receiver model: Ashtech Z-12 antenna: Geodetic 3 reference standard name: UTC(USNO(MC2)) reference standard type: steered H-MASER</p> <p><u>LOGS:</u></p> <p><u>NOTES:</u></p> <p>This receiver is owned by the National Imagery and Mapping Agency (NIMA)</p>

USNO(g)	Receiver System Hardware Information:
TW	<p>modem model: EACS-TWSTT-2000(sn#103) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>NOTES:</p>
CV	<p>receiver name (local): AOA1 SNxxx receiver model: AOA-TTR4P antenna: XXX reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p> <p>LOGS:</p> <p>AOA1 calibration history:</p> <p>NOTES: Receiver not calibrated.</p>
CP	<p>receiver name (local): NIM2 receiver model: Ashtech Z-12 antenna: Geodetic 3 reference standard name: UTC(USNO(MC2)) reference standard type: steered H-MASER</p> <p>LOGS:</p> <p>NOTES:</p> <p>This receiver is owned by the National Imagery and Mapping Agency (NIMA)</p>

USNO(h)	Receiver System Hardware Information:
TW	<p>modem model: Mitrex-2500(sn#85006) antenna: 4.6m-steerable-vertex reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p>
	<p><u>LOGS:</u></p> <p><u>NOTES:</u></p>
CV	<p>receiver name (local): TTR1 SN440 receiver model: AOA-TTR6 antenna: xxx reference standard name: UTC(USNO(MC2)) reference standard type: H-MASER(steered)</p>
	<p><u>LOGS:</u></p> <p>TTR1 calibration history: TTR1(SN440) delay change on MJD 50566 (04/28/97): Internal=68 TTR1(SN440) delay change on MJD 50973 (06/09/98): Internal=67 TTR1(SN440) delay change on MJD 51135 (11/18/98): Internal=68 TTR1(SN440) delay change on MJD 51260 (03/23/99): Internal=67</p> <p><u>NOTES:</u> This is the primary USNO SPS receiver.</p>
CP	<p>receiver name (local): NIM2 receiver model: Ashtech Z-12 antenna: Geodetic 3 reference standard name: UTC(USNO(MC2)) reference standard type: steered H-MASER</p>
	<p><u>LOGS:</u></p> <p><u>NOTES:</u></p> <p>This receiver is owned by the National Imagery and Mapping Agency (NIMA)</p>